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U. S. DEPARTMENT OF AGRICULTURE.
DIVISION OF ECONOMIC ORNITHOLOGY.
BULLETIN NO. 2.

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REPORT

ON

BIRD MIGRATION

IN THE

MISSISSIPPI VALLEY

IN

THE YEARS 1884 AND 1885,

BY

W. W. COOKE.

EDITED AND REVISED BY DR. C. HART MERRIAM.

WASHINGTON:
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LETTER OF TRANSMITTAL.

UNITED STATES DEPARTMENT OF AGRICULTURE,
DIVISION OF ECONOMIC ORNITHOLOGY AND MAMMALOGY,
Washington, D. C., July 20, 1887.

SIR: I have the honor to transmit herewith, for publication as Bulletin No. 2 of the Division of Economic Ornithology and Mammalogy, a special report upon Bird Migration in the Mississippi Valley in 1884 and 1885, by Prof. W. W. Cooke.

Respectfully,

C. HART MERRIAM,
Ornithologist.

Hon. NORMAN J. COLMAN,
Commissioner of Agriculture.

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PREFATORY LETTER.

The present report, which has been prepared by Prof. W. W. Cooke, with the assistance of Mr. Otto Widmann and Prof. D. E. Lantz, is the first fruit of the co-operative labors of the Division of Economic Ornithology of the Department of Agriculture and the Committee on Bird Migration of the American Ornithologists' Union. It consists of two parts: (1) an introductory portion treating of the history and methods of the work, together with a general study of the subject of Bird Migration, including the influence of the weather upon the movements of birds, the progression of bird waves and causes affecting the same, the influence of topography and altitude upon migration, and the rates of flight in the various species; and (2) a systematic portion in which the five hundred and sixty species of birds known to occur in the Mississippi Valley are treated serially, the movements of each during the seasons of 1884 and 1885 being traced with as much exactness as the records furnished by the one hundred and seventy observers in the district permit.

The chapters entitled "The Relation of Migration to Barometric Pressure and Temperature," and "A Study of the Bird Waves which passed up the Mississippi Valley during the Spring of 1884," are worthy of the most careful perusal; and the articles on the Kingbird and Purple Martin, in the systematic portion of the report, are particularly instructive. Indeed, I feel no hesitancy in expressing the belief that the present report is the most valuable contribution ever made to the subject of Bird Migration.

For the opinions herein expressed, relating to the theoretical questions involved in the study of Bird Migration, Professor Cooke alone is responsible. Some of these opinions are diametrically opposed to those held by the editor, but in a few instances only has the editor taken the liberty to add his views on the subject; in all such cases the interpolated remarks will be found in bracketed foot notes, over his initials. In fact, it has not been thought proper to make any changes in the First Part of the report, save the verbal alterations necessary in preparing it for the press. In the Second Part, or "Systematic Report," the case is entirely different, for this portion of the report deals with fact instead of theory. Here the editor has deemed it his duty to make the subject-matter conform to the present state of knowledge on the subject. With this end in view, changes have been made freely, and the portions relating to the geographical distribution of the various species and subspecies have been largely rewritten. In this task the editor has received invaluable assistance from Mr. Robert Ridgway, Curator of Birds in the U. S. National Museum.

The nomenclature adopted is that of the new Check List of the American Ornithologists' Union, with the additions and corrections contained in Ridgway's Manual of North American Birds, which, fortunately, became available just as this report was going to press. The number in brackets following each name is that which the species bears in Ridgway's Nomenclature of North American Birds, as published in Bulletin 21 of the U. S. National Museum, 1881.

The admirable map which accompanies this report has been prepared under the supervision of Mr. Henry Gannett, chief geographer of the U. S. Geological Survey.

My own connection with the report has consisted in bringing together under the head of each species the matter contributed separately for the two years; in arranging it in accordance with the nomenclature of the American Ornithologists' Union; in revising* the systematic portion of the report (Part Second); in incorporating the original Appendix† into the body of the text, and in the editorial revision of the manuscript of the whole report—a labor which, for the past year and a half, has consumed all of the time not required in the performance of my routine official duties.

C. HART MERRIAM,
Editor.

WASHINGTON, D. C., *July* 20, 1887.

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* This revision has consisted in rewriting the *habitats* of most of the species and subspecies; in casting out some forms which had been included upon erroneous identification or insufficient evidence; in correcting statements of fact; in transferring (in a few cases) the notes sent under a stated species or subspecies to a nearly related species or subspecies known to inhabit the region under consideration to the exclusion of the form reported; in the addition of a number of species and subspecies now known to inhabit the region; in the insertion of additional matter under species already given; in the interpolation of authorities for second-hand statements; and in the omission of matter of questionable reliability. In all of these directions the editor feels that the report is susceptible of still further improvement, but want of time and reluctance to longer delay the publication of an already long-delayed and much-clamored-for document must be his excuse for its incompleteness and imperfections.

† The original appendix consisted of a very briefly annotated list of about one hundred and forty birds supposed to inhabit the District, but concerning which no reports had been received from our observers. Some of these have been eliminated, as resting upon insufficient evidence; the remainder, for the convenience of those who use this book, have been incorporated in their proper places in the general text, accompanied by a statement of their geographical distribution, and such other facts of interest as might be added without too greatly increasing the bulk of the report.

FIRST PART.

BIRD MIGRATION IN THE MISSISSIPPI VALLEY.

By W. W. Cooke.

In the winter of 1881–'82 the attempt was made to secure the assistance of the ornithologists of Iowa in studying the migrations of birds; but a change of residence on the part of the author from Iowa to Minnesota necessitated a modification of the original scheme, and it was decided to increase the size of the area to be investigated so as to include the whole Mississippi Valley. All the ornithologists of that district were invited to co-operate by contributing notes on the winter birds and reporting dates of the spring arrivals. Answers were received from 26 persons who promised to aid in the work, but at the end of the season it was found that but 13 had actually forwarded observations. These 13 were distributed as follows: Arkansas, 1; Missouri, 2; Kansas, 1; Illinois, 3; Nebraska, 1; Iowa, 2; Minnesota, 2; Wisconsin, 1. Thus it will be seen that a small part only of the Mississippi Valley was represented. The notes contributed were published, without comment or change, in Forest and Stream for October, November, and December, 1882.

The same work was undertaken for the spring of 1883, and, by a liberal use of the press, a much larger corps of observers was obtained. The names of 42 persons were received, but of these 26 only furnished reports. They were distributed as follows: Texas, 1; Mississippi, 2; Tennessee, 1; Kansas, 2; Arkansas, 1; Missouri, 3; Illinois, 7; Iowa, 4; Wisconsin, 2; Minnesota, 3—thus leaving Louisiana, Indian Territory, Nebraska, and Dakota with no representatives.

The larger part of the hundreds of notes received from these observers was never written up, and for that reason frequent reference will be made to them in the present report.* Some of the species were treated in the Ornithologist and Oölogist for 1883, and the full notes from two of the stations appeared in the American Field for December, 1883, and January, 1884, and were afterwards issued as Bulletin No. 1 of the Ridgway Ornithological Club of Chicago.

The founding of the American Ornithologists' Union (in September, 1883) greatly enlarged the scope of the work, but did not materially

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[* Since the above was written most of these notes have been printed in the Ornithologist and Oölogist.—C. H. M.]

alter its character. As is well known, this society was formed of the most prominent ornithologists of North America, and gathered to itself the best of the younger active field workers.

When, therefore, it was announced that, at the first meeting of the new Union, "a committee was also appointed on the 'migration of birds,' to co-operate with Mr. W. W. Cooke in connection with his work on this subject in the Mississippi Valley, and consists of the following gentlemen, with power to add to their number: Merriam, Brown, Purdie, Wheaton, Chamberlain, Grinnell, Henshaw, Cory, Merrill, Fisher, Bicknell, Mearns, and McIlwraith,"* a new impulse was given to the work, and ornithologists all over the district hastened to send their offers of aid.

Under the efficient management of the chairman of the committee, Dr. C. Hart Merriam, arrangements for the spring campaign were soon completed. The whole of the United States, British America, and Alaska were included in the scheme, and the field was divided into fourteen districts, each under the charge of its own superintendent. The superintendency of the work in the Mississippi Valley remained in the same hands as for the two previous years, and the district was made to include Mississippi, the portions of Kentucky and Tennessee west of the Tennessee river, Illinois, Wisconsin, the northern peninsula of Michigan, Louisiana, Arkansas, Missouri, Iowa, Minnesota, Texas, Indian Territory, Kansas, Nebraska, Dakota, and Manitoba.

The work begun in the Mississippi Valley December 1, 1883, under the auspices of the American Ornithologists' Union, has been carried on uninterruptedly to the present date. Its progress has been chronicled from time to time in The Auk, and in the Ornithologist and Oölogist, in which latter magazine, for May, 1884, appeared a list of the observers and a rough map of the district, showing the location of the stations. Since then the names of many new observers have been added until the number at the close of the season of 1884 was 160. Reports on spring migration in 1884 were received from 109 stations. These reports may be characterized as follows: Merely a few notes, 25; a scattered report on the whole or a part of the migration, 50; a full report on the whole migration, 34. These 109 stations were distributed over the Mississippi Valley as follows: Mississippi, 6; Tennessee, 1; Illinois, 22; Wisconsin, 14; Louisiana, 2; Arkansas, 1; Missouri, 9; Iowa, 18; Minnesota, 11; Texas, 4; Indian Territory, 2; Kansas, 5; Nebraska, 3; Dakota, 8, and Manitoba, 3.

Reports were received on the fall migration of 1884 from about half a dozen observers. Individually, these reports were of a high grade of excellence, but their number was too small to allow of any accurate tracing of the southward movements of the various species. They will be found incorporated in the body of this report.

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* Bull. Nutt. Ornith. Club, Vol. VIII, 1883, p. 225.

THEORETICAL CONSIDERATIONS.

Before proceeding to treat in detail of the phenomena presented by the records of the migration observers, it may be well to glance for a moment at the general causes of migration, and at some of its more striking and interesting features.

Without entering into a discussion of the causes which long ago started birds on their periodical change of habitation, we shall not be far out of the way in considering their present migrations the result of inherited experience. To be more explicit, the first migrations were doubtless very limited in extent and probably were intelligent movements which through repetition became habitual, and the habit was transmitted from parent to offspring until it has become, as we see it now, the governing impulse of the bird's life. It is undoubtedly true that love of the nesting ground, which is to them their home, is the foundation of the desire for migration;* and year after year they find their way thousands of miles back to the same box or tree by the exercise of memory—not always the memory of the individual, but the memory inherited from numberless preceding generations which have passed and repassed over the same route.

In the study of the yearly cycle of migrations there are two movements for which we must seek the cause—the restless pushing northward in the spring, in spite of cold, rain, sleet, and snow; and the southward journey in the fall. We have already stated that the northward movement is caused by a strong home love—an overpowering desire to be once more among the familiar scenes of the previous summer. The return movement is obviously the result of two causes—the approach of winter and the failure of the food supply. Of these two, the latter is probably by far the more powerful, since it is well known that single individuals of species which retire far to the south often remain behind, and, favored by an abundance of food, withstand the most severe weather. Thus, many Red-headed Woodpeckers remain through the winter in the cold climate of northeastern New York, frequenting the heavy timber where there is a great quantity of their favorite food;† and it is not unusual for a few Robins to spend the winter in north-central Wisconsin, sheltered in the thick pine forests; while Ducks and even Wilson's Snipe have been known to remain throughout the whole

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[* I cannot concur with Professor Cooke in the belief that "love of the nesting ground * * * is the foundation of the desire for migration." In a lecture on Bird Migration which it was my privilege to deliver in the U. S. National Museum, April 3, 1886, I said: "Some ornithologists of note have laid special stress upon the '*strong home affection*' which prompts birds to leave the South and return to their breeding grounds. To me this explanation is forced and unnecessary. Birds desert their winter homes because the food supply fails; because the climatic conditions become unsuited to their needs; because the approach of the breeding season gives rise to physiological restlessness; and because they inherit an irresistible impulse to move at this particular time of the year."—C. H. M.]

† Merriam, Bull. Nutt. Ornith. Club, Vol. III, No. 3, July, 1878, pp. 123–124.

winter in Wyoming, near the hot springs, whose warmth keeps the neighboring waters and ground from freezing. Nevertheless, it is as yet unexplained why some birds, notably many of the warblers, retire in winter to such a great distance south, some even crossing the equator and passing several hundred miles beyond. Certainly neither cold nor hunger can be the cause of such wanderings.

It has been often noticed that during the fall migration many birds seem to be able to foretell the approach of storms from the north, and hurriedly depart southward, before human eyes can detect any signs of the coming change. There is a large accumulation of evidence on this point, all seemingly in support of the proposition which has been formulated by one of our leading ornithologists in the following words: "Birds discern approaching meteorological changes."* Some ornithologists deny this, saying that in such cases the birds have out-traveled the storm, in which they were at first caught, their superior powers of flight enabling them to pass ahead of it; or that they have been warned by the hasty approach of more northern birds coming from the area over which the storm was moving.

If we study fall migration merely, there seems to be no doubt of the truth of this statement, but if we include spring migration the question becomes much more involved. If birds discern approaching meteorological changes, why is it that so many thousands perish each year by being caught in storms and frozen to death? Certainly an approaching storm in spring must give just as plain and early a warning as one in the fall, yet the same birds which are said to foresee it at the latter time and escape, rush blindly forward a few months later and are overtaken, their death paying the penalty of their rashness. The hardy waterfowl (Ducks and Geese) push northward in the spring, encounter storms, and are turned back, only to repeat the same thing a dozen times before they reach their summer quarters, but each time, instead of avoiding the approaching storm, they do not retreat until its actual presence drives them back. If they can foresee these changes, then their love of home and their desire to return to it must be wonderfully strong.

SPEED AT WHICH BIRDS MIGRATE.

In studying the speed at which birds proceed northward in their migrations one is beset by many difficulties. To determine the comparative speed of the several species is easy enough, but to determine the absolute rate—the exact number of miles which a particular bird makes during one day's journey—is beyond our power. If migration were a steady movement northward, with the same individuals always in the van, numerous careful observations might make it possible to arrive at an approximation to the truth; but instead of this, migration is performed something after the manner of a game of leap-frog. While in the fall migration the younger birds lead,* in the spring they loiter behind, and it is the old birds, those in whom we may suppose the love of home and the desire for procreation are strongest, which press forward so eagerly. Moreover, of these old birds, those which arrive first at a given place, as a rule, are birds which lived there the previous summer and which will remain there to breed.† Thus the vanguard is constantly arresting itself, and the forward movement must await the arrival of the next corps, which may be near at hand or far in the rear. The movement of migration, then, is made up of a series of constant overlappings, and the real speed is evidently much greater than the apparent. Of this real speed of transit we can take no account, and our calculated rates, therefore, are of value only in so far as they show the relative speed of migration of the different species. In the accompanying report the speed of migration is calculated in the following manner: The most southern reliable record is selected for comparison with the most northern record of the same character; the distance in miles between these two stations is divided by the number of days elapsing from the time the species made its appearance at the southern station to the date at which it was seen by the northern observer. The result gives the average daily rate of migration in miles for the species. For example: The Baltimore Oriole was seen at Rodney, Miss. (lat. 31° 52′), April 7. It was not seen at Oak Point, Manitoba (lat. 50° 30′), until May 25. It was therefore 48 days in passing over the 1,298 miles between the two stations, which gives an average speed of 27 miles a day. This subject will be treated as thoroughly as possible, since it has received little or no attention heretofore; indeed, there were no data in existence for its study until the notes were collected on which the present report is based.

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*J. A. Allen, in Scribner's Monthly Magazine for October, 1881, p. 938.

The first records published in this country relating directly to the speed at which birds travel appeared in the Ornithologist and Oölogist for January, 1884 (pp. 1 and 2). These notes were based on the records of six species in the spring of 1883; and though the notes for 1884 are many fold more numerous they do not give grounds for a change in the general rate of speed set forth in that article. It must be kept constantly in mind, however, that no complete and scientific study of the subject is as yet possible, and that the present records are given merely because they are the best now obtainable, and because they may furnish some material for the use of the future student.

The records of fifty-eight species for the spring of 1883 give an average speed of 23 miles a day for an average distance of 420 miles.

[* The opinion here expressed by Professor Cooke, namely, that in fall young birds migrate before their parents, has been long accepted in Europe, but is contrary to the experience of most leading American ornithologists and to the evidence collected by the Committee on Migration of the American Ornithologists' Union, as will appear in a future publication of the Division. See, also, Mr. Brewster's recent essay on the subject, in the Memoirs of the Nuttall Ornithological Club.—C. H. M.]

[† This statement needs much qualification.—C. H. M.]

A slightly smaller number of species for the spring of 1884 give exactly the same average speed over an average distance of 861 miles. Hence it is probable that future observations will not materially change this estimate.

A study of the records for 1883 led to the statement that in spring birds migrate more rapidly in the northern portion of their routes of travel than in the southern. As this statement was based on the notes of one year only, it became a matter of much interest to ascertain whether the facts observed would hold good in future seasons and thus admit of formulation as a general law, or whether they had been the results of specially favorable conditions in the latter part of a single season. Accordingly, in the spring of 1884, twenty-five species of well-known birds, concerning which we had full records, were selected for careful study. The result bears out the foregoing statement. The distance traveled was divided as nearly as possible into two equal portions and the speed was calculated for each. Some of the records do not admit of division; others show an equal speed throughout; while six show an increase of 77 per cent. in speed for the northern half, and three show a decrease of 47 per cent. Thus it will be seen that the record is strongly in favor of the increase. The same result may be reached by calculating the average speed of these twenty-five species separately for each of the different months in which migration is performed; the average speed for March is 19 miles, for April 23 miles, and for May 26 miles, per day. The record for 1884 also confirms the statement that the later a bird migrates the higher average speed it will attain. This would naturally be inferred from the preceding remarks.

These calculations are averages which give the rate of speed at which the bird would travel provided it moved regularly each day. But we know that many pauses occur, that on many days there is no advance; hence, on the days of movement the speed must be much higher than that given. This is clearly seen in the case of the Purple Martin. From latitude 38° 40′ to 46° its average rate is but 13 miles a day; but we have good reason to believe that there was a pause from April 3 to April 14, and another from April 18 to May 3. Taking out the first of these pauses, the rate is raised between latitude 38° 40′ and latitude 43° 43′ to 35 miles a day, and, not counting the second pause, the rate for the rest of the distance is 28 miles.

We must also take into consideration the fact that in all probability the same bird seldom migrates for several nights in succession, but stops to rest after a flight of a night or two, so that the birds migrating one night are not the same individuals that were moving the night before.

It has been stated above that the average rate for April is greater than that for March, and is exceeded by that for May; but it cannot be said that the actual number of miles performed in a night's journey is therefore greater. This may or may not be the case. The facts observed will be sufficiently clear if it is remembered that the later in the season a species moves the less hindrance it will meet from the elements, and the fewer pauses will be necessitated in its journey. During the month of May there are few if any nights in which migration does not take place; while a bird that migrates in March must expect to be stopped by storms at least one week in four.

In regard to the relative speed at which the different species travel, all that can be said at present is that those which migrate later have, as a rule, the highest rate. Thus the average speed of the Robin, Cowbird, and Golden-shafted Flicker is about 12 miles a day, while the average of the Summer Redbird, Baltimore Oriole, Ruby-throated Hummer, and Nighthawk is 28 miles. If we try to calculate the relative speed of the different families, we find that some of the species in a family migrate early and slowly, others late and rapidly, bringing the average of most of the families very close to the general average of all, which, as already stated, is 23 miles a day.

Birds have seldom been seen while on their way in undisturbed migration at night. The observations given by W. E. D. Scott and J. A. Allen (Bull. Nutt. Ornith. Club, Vol. VI, 1881, pp. 97–100, and 188) are the most important, but in these nothing is said concerning the speed at which the birds were supposed to be moving. It is known that birds do not move rapidly, as a rule, when migrating in the day-time, but from the meager material at hand it may be inferred that the speed at night is considerably greater. During day-migration the smaller land birds rarely fly faster than 15 miles an hour, though the larger birds, such as Cranes, Geese, Ducks, etc., move much more rapidly. At Red Rock, Ind. Ter., between August 25 and September 5, 1884, the Cliff Swallows and Nighthawks were conspicuous every morning and evening, slowly drifting south and southwest in their fall migration. For an hour and a half parties of birds would pass by in almost unbroken succession. Many hundred Nighthawks were seen during a single evening, and the number of Swallows was much greater. The result of timing them on several occasions gave a rate of about 10 to 14 miles an hour, the former being the more usual speed. This slow rate was caused by the irregularity of the flight, as the birds captured their evening and morning meals on the wing. The morning flight lasted an hour only, and was made at about the same speed. Thus a distance of about 30 miles would be traveled by each individual during the morning and evening together, but no one can say how much farther, if any, they traveled during the night.*

The advance of the hosts of Warblers, as they move incessantly forward from tree-top to tree-top, is still slower, probably being but a few miles during a whole day. Geese in their northward flight along the

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[* The material gathered from the keepers of light-houses seems to indicate that neither Swallows nor Nighthawks migrate to any extent after night fall.—C. H. M.]

Atlantic coast traverse great distances, sometimes covering from 300 to 600 miles at a single flight; and it cannot be said positively that the larger birds do not do the same over the land. Still, the records so far made seem to indicate that the smaller land birds, such as Warblers, Finches, and the like, do not perform long journeys at one time when over land, but their voyages over the Gulf of Mexico prove that even these small species possess great power of flight.

The preceding discussion shows that we are entirely wanting in exact knowledge on the subject, and that for some time to come all we can hope to do is to gather material. In this connection the facts accumulated by the keepers of light-houses are of the utmost importance, and the publication of the report containing these data is looked for with great interest.

THE RELATION OF MIGRATION TO BAROMETRIC PRESSURE AND TEMPERATURE.

In studying the spring migration of 1884 use was made of the tri-daily weather reports of the Signal Service, of which about 50 stations were in or near the Mississippi Valley. These reports give the temperature, state of barometer, dew point, direction and force of wind, amount of rainfall, and character of the sky. The observations on which they are based were taken at 7 a. m., 3 p. m., and 11 p. m. In the following study the 11 p. m. records were used for those birds which migrate by night, and the 7 a. m. records for such species as Ducks and Geese, which perform the bulk of their movements in the forenoon.

To render the study more easy, weather maps were made, one for each day, based on the 11 p. m. observations. The maps were made as nearly as possible like those now printed daily by the Signal Service at Washington; that is, the state of the weather and the direction of the wind were marked at each station on the map in symbols which are plain and easily comprehended, so that the eye could take in at a glance the general state of the weather in the whole Mississippi Valley. At each station the temperature, state of barometer, and force of wind were indicated. Dotted lines were then drawn connecting all places having the same temperature, and solid lines connecting places of equal barometric pressure. The former, called isothermal lines, were drawn for every five degrees of Fahrenheit; while the latter, called isobaric lines, were drawn for every tenth of an inch of pressure. The area of the lowest pressure is never stationary, but is constantly moving, and in an easterly direction. It may be moving northeast, east, or southeast, and rarely north or south; but never northwest, west, nor southwest. The usual direction in the Mississippi Valley is a little south of east. It so happens that the particular wave which we study moves northeastward, but this is an exception to the general rule. Though it may move south or north for a time, it will surely turn east in the end. In the body of the report, under the Purple Martin, the relation of migration to atmospheric cold and warm waves is discussed, and the statement is there made that the warm waves begin in the northwest and move toward the southeast. The cause of this lies in the movement of the area of low pressure. It is a law of the movement of winds that they go toward an area of low pressure, and from an area of high pressure. If, then, an area of low pressure develops, say in southwestern Dakota, it will be but a few hours before a south or southeast wind will be blowing over Nebraska and Kansas, and a warm wave will be started in these States. As this area passes eastward to Minnesota its effect will begin to be felt in Iowa, Missouri, and Arkansas, while by the time it has reached Lake Michigan it will probably have produced southeast winds even to the Gulf of Mexico. But an area of low pressure is followed by one of high pressure, producing an opposite effect, and the isotherms which bent north to welcome the coming of the low area turn rapidly southward before the icy breath which blows from an area of high pressure. Thus the cold and warm waves both come from the same quarter, and both move in the same direction; that is, the direction in which the area of low pressure is advancing. Since it is known that low pressure is generally accompanied by clouds and rain, while areas of high pressure are cloudless, it would be naturally supposed that migration would take place during high pressure; but, as has already been stated, the area of low pressure attracts a south wind, and the increased warmth more than overbalances the cloudiness. Fully 60 per cent. of the spring migration of 1884 took place in cloudy weather. It is probable, though I am not aware that it has as yet been proved, that in the fall migration the reverse is the case, and the larger movement takes place in clear weather.

Following is a full record of the relation of migration to atmospheric conditions for the seven days from March 19 to 25, 1884, contrasted with a week's migration in May.

March 18, 1884, at 11 p. m., there was no marked*atmospheric disturbance throughout the United States. The minimum of the cold wave had occurred the day before and the temperature was gradually rising in the Upper Mississippi Valley. It is this part of the Mississippi Valley (from latitude 39° northward) to which the present study is confined. The temperature was quite high (50° at Saint Louis, and 37° at Saint Paul), but fell rapidly from Saint Paul northward till it reached 20° at Moorhead, Minn.* The barometer varied only two-tenths of an inch from 29.9 inches in eastern Arkansas and southern Illinois to 30.1 at Moorhead, Minn. The prevailing winds were very light E. to N. The weather was cloudy, with several light rains. There was little change toward the morning of March 19, except the shifting of the wind to N. and NW., while the area of low pressure moved east to Cape Hatteras. Very little migration took place, and the few birds that were moving northward may be well called "birds of the first wave," that is, Ducks, Geese, Blackbirds, Meadowlarks, Robins, and Bluebirds. These are the birds with which we have to deal in the study of these seven days. Migration was reported from southern Wisconsin and northern Illinois, against a northeast wind, with the temperature but two or three degrees above freezing, and from east-central Kansas under slightly warmer conditions. It seems likely that some of these notes belong to a warm wave which occurred two days before, but it is also certain that some Ducks and Geese were migrating in the early morning hours, straight against the northerly winds.

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* It need hardly be said that no one can follow these remarks intelligently without referring to the map accompanying this report.

March 19 at 11 p. m. an area of slightly lower pressure had just passed over the Upper Mississippi Valley, and the barometer rose steadily all night. Between Saint Paul and Saint Louis the temperature remained the same as the day before; northward it was slightly higher; the winds were light, and were everywhere from NE., NW., and W. The temperature ranged from 45° at Saint Louis to 26° at Moorhead. The average barometer, at 11 p. m., was 30.07 inches, and at 7 a. m. of the 20th, 30.15 inches. Cloudy weather was reported everywhere except in the Lake Superior region. In general, the condition may be said to have been very unfavorable for migration, yet new arrivals were still noted from the same places as on the day previous, with the addition of records from southeastern Dakota, eastern Iowa, and south-central Iowa. It would seem that the Ducks and Geese were so desirous of reaching their breeding grounds that they pushed northward in spite of the wind and the clouds, as soon as the temperature rose two or three degrees above freezing, regardless of the fact that the winter's snow still covered the ground, and the lakes and rivers were still bound with ice. Not until a week later did any streams open in the region which was now being invaded by the migrating hosts.

March 20 was characterized by very high barometer and by a marked advance of the isotherm of 30° to points north of Duluth and Moorhead. There was no place in the Upper Mississippi Valley at 11 p. m., March 20, where the pressure was less than 30.2, and in western Dakota it was 30.3. Calm weather or very light north winds prevailed, with clear weather along the Mississippi and the Great Lakes, and cloudy weather with light rains on the Missouri. The minimum temperature at Saint Louis was 43°; at La Crosse 37°; at Saint Paul 20°, and at Moorhead 23°. It was a moderately fair night for migration. The culmination of the high pressure was reached, and already in the southern Rocky Mountain region the low pressure was developing which was to bring about the immense movements which took place during the next three days; already the isotherms in that quarter were beginning to move northward and the wind along the Gulf coast had changed to SE. The birds seemed to have a foreknowledge of the approaching change, for twice as many 'firsts' were recorded as during the two previous days. Some of these came from central Missouri, where the change was at this time slightly felt. The main portion came from the same districts as on the day previous. There was practically no advance of the van, but a filling up of the country already traversed by the scouts.

On the night of March 21, at 11 p. m., an area of low barometer (29.9 inches) was passing eastward across the Upper Mississippi Valley and was central at North Platte, Nebr. It produced SE. winds of moderate strength in all the Mississippi Valley except the extreme northern part, above La Crosse. The temperature rose throughout the district to 56° at Saint Louis and 35° at Saint Paul; but north of this, beyond the influence of the SE. wind, it fell rapidly to 18° at Moorhead and 11° at Saint Vincent. The isotherm of 40° was carried up to La Crosse. As morning approached, the temperature still rose in the northern part and the sky became overcast with some local clouds and rain. It was a night of much migration, owing to the influence of the area of low pressure, which at 7 a. m., March 22, was central at Omaha and Yankton, where the barometer at 3 p. m. registered 29.74 inches. This was a fall at Yankton of .32 inch during sixteen hours, while the center of the low area moved but a few miles; and the necessary result was a great rise in temperature and consequently great movements among birds. But the movements took place only to the east of the low pressure area; for it is a law of atmospheric circulation that the winds are attracted from the south, not directly toward the center of the low pressure area, but toward places to the east of it in the same direction that it is moving, while the winds which it attracts from the north move toward places to the west or behind it. Migration, therefore, would be looked for in vain to the south, west, or north of Yankton. The whole of this immense movement, which in number of records was as great as that of the three previous days together, and in number of individuals was many times greater, took place to the southeast and east of Yankton. The SE. winds prevailed up to La Crosse, and this place also marked the limit of the night's movement in that direction. A map was made of the migration which took place on this day, and it was found to cover a very nearly circular area, 250 miles in diameter, the center of which was midway between Keokuk and Davenport. Some idea of the great number of birds which were migrating during this night may be had from the fact that at Saint Louis twenty-six different species were noted as having arrived or increased. It is well to bear in mind that all these birds were migrating on a rapidly falling barometer, hence in the face of what is usually considered a sign of an approaching storm; and it may be noted also that all this great movement did not advance the van, which remained where it had been before.

March 23, bird migration was at a standstill. The area of low pressure, which was central at Yankton in the afternoon of the 22d, had moved to Saint Paul by 11 p. m., the barometer falling steadily to 29.61 inches. During the night it moved NE. to Marquette, Mich., falling still more to 29.56 inches. In the mean time an area of high pressure developed at Dodge City, Kans. The effect on the wind was as follows: From Saint Louis southward the winds began to shift to SW.; to the northwest of that place they became NW. and N.; while to the northeast of Saint Louis they shifted to SW. and W. As would be expected, those places which had W. and NW. winds had clear skies, while the district from Saint Paul and La Crosse to Chicago and eastward was cloudy. The temperature from Saint Paul northwest, north, and northeast rose. At Saint Paul it was stationary, and thence southward it fell a few degrees, but still remained warm. The wave of migration seems to have exhausted itself in a single night. Some forty 'firsts' were recorded for this day, but, except at two places, they seem to have been arrivals of the previous day, which had been overlooked. These two stations, Waupaca, Wis., and Heron Lake, Minn. (with its neighborhood), furnished one-half of the forty records, and both are on the northern edge of the district covered by the preceding night's migration. It seems, then, that at these places there was a local, though, in the case of Heron Lake, a very large migration.

March 24 was marked by cloudy weather after a clear night. Southerly winds prevailed over the Upper Mississippi Valley, varying from SE. to SW., and mostly light. The temperature had fallen, on an average, 5° from Chicago to Bismarck and northward. It had risen strongly 9° to 11° at Yankton and Omaha, this rise probably being the cause of the arrival of immense numbers of water-fowl during the day at Heron Lake, Minn., all coming from the west, that is, from the direction of Yankton, at which place at 7 a. m. a S. wind was blowing. It was a day of general low pressure. The whole district, from Cairo to Moorhead, was included between 29.80 and 29.89 inches. Northward and eastward, in Manitoba and at Marquette, Mich., the barometer fell to 29.65; in the southwest, at Fort Smith, Ark., it fell to 29.71; and westward, at Deadwood, Dak., it rose to 30. An area of low pressure developed at Fort Smith, Ark., in the early evening of March 23, and became pronounced during the next twenty-four hours. At 7 a. m. of the 24th the effect of this area was hardly felt, but by night the wind had been attracted to it over most of the Upper Mississippi Valley, bringing from the north colder, clearer weather. This day, therefore, was the turning point, and the beginning of a cold wave which was already felt to the northwestward of Cheyenne. The temperature at 11 p. m., March 24, was 47° at Saint Louis, 42° at Chicago, 50° at Des Moines, 37° at Saint Paul, and 32° at Moorhead.

This was the last day of the warm wave which commenced on the evening of March 21, and the birds made the most of their opportunity and advanced a whole degree farther north. The hosts which had rested during the night of the 22d moved forward and fully occupied all the country up to latitude 45°, with an innumerable host along the Mississippi River at 45° 25′, and scouts up even to 47° on the Missouri.

That this was the culmination is easily seen from the records, which fell from seventy-three notes on the 24th to but seventeen the next day.

Let us now calculate the average conditions under which birds were migrating during these seven days. A few more than three hundred records of 'firsts' were contributed for these seven days, and the temperature at which the species were migrating is found to be as follows: 25°, one record (a Goose, in more senses than one); 29°, a cousin to the last; 31°, eighteen firsts; 33°, twelve firsts; 35°, eleven firsts; 37°, forty firsts; 39°, forty-one firsts; 41°, fifty-two firsts; 43°, sixteen firsts; 45°, twenty-five firsts; 47°, five firsts; 49°, seventeen firsts; 51°, nine firsts. Thus it will be seen that the favorite temperature for migration of "birds of the first wave" ranges from 37° to 41° Fahrenheit.

In cloudy weather there were 143 records; in clear weather 101, or exactly 60 per cent. cloudy, to 40 per cent. clear.

With reference to the wind, it has been found that with the wind north there were 29 records; NE., 31; E., 12; SE., 75; S., 23; SW., 27; W., 39; and NW., 9. It will be noticed that the most unfavorable winds, namely, the E. and NW., are directly opposite those winds which have the greatest number of records. Combining, we have for E. and W., 51 records; for NW., N., and NE., 69; and for SE., S., and and SW., 125 records, showing how greatly the birds prefer a southerly wind to help them on their journey.

The effect of barometric pressure will appear from the following statement: March 19 there were 24 records with an average pressure of 30 inches; March 20, 35 records at 30.04 inches; March 21, 43 records at 30.24 inches; the 22d, 82 records at 30.15 inches; the 23d, 45 records at 29.80 inches; the 24th, 73 records at 29.85; and the 25th, 17 records at 29.86 inches. These give an average of exactly 30 inches, or the normal pressure; but it must be remembered that the great wave of the 22d began when the pressure was very high and took place on a falling barometer. It is probable that a large number of observations taken throughout the season would give from 29.93 to 29.95 as the average pressure at which most birds migrate.

The above study of the influence of atmospheric conditions upon migration pertains to a single week in March, when the first wave was passing over the Upper Mississippi Valley. A similar study will now be made for a week in May, just before the close of migration for the spring. The seven days from May 4 to May 10, 1884, have been chosen. This brief period includes two warm waves and an interim of indeterminate nature. Naturally, the birds were migrating under very different conditions, and, as a result, a very different set of birds was concerned. One may look in vain for notes on Ducks, Geese, Robins, and other early species. In their stead the brilliantly-colored Orioles, Grosbeaks, Indigos, and Tanagers will be found. In the place of the frost and cold of March, there is a summer temperature with frostless nights, and swarms of insects are ready for the Warblers, Vireos, and Flycatchers. But the laws of atmospheric movements remain unchanged, and their effect on the movements of birds is the same in kind, but slightly different in degree. A north wind still retards their movements, but it comes with no icy breath, and when the fancy takes them they move easily against its no longer dreaded force.

May 3, the record began at 11 p. m., at which time there was an area of low pressure in northeastern Dakota and Manitoba, the barometer being very low at Qu'Appelle (29.38 inches). Most of the Mississippi Valley was included between 29.7 inches and 30.0 inches, the latter being the reading all along our eastern border.

This low area produced southerly winds over most of the district, there being nothing but S., SE., and SW. winds in the region north of Saint Louis. The temperature was high (58° to 61°) along the Mississippi and the lower Missouri to Saint Paul and Omaha, falling to 55° at Saint Vincent and Bismarck, and falling rapidly around the lakes to 42° at Marquette. South of Milwaukee and Omaha the weather was cloudy; north of these places, clear. During the night the low area moved south to a point a little below Bismarck, the south wind still blowing over the Mississippi Valley, with increased cloudiness in the northern part. By 3 p. m. May 4, West Las Animas, Colo., was the center of the low area, and there was a decided fall in pressure over all the United States east of the Rocky mountains, causing the south wind to blow still harder, with clouds and local rains in the Upper Mississippi Valley. Such was the preparation for the bird wave of the night of May 4, for after 3 p. m. the low area turned northeastward and passed directly across the upper part of the district, being central at Yankton at 11 p. m., with a pressure of 29.64 inches. Thus all the migration during the nights of May 3 and 4 was on a falling barometer—on the night of the 4th with cloudiness, and on both nights with warm southerly winds.

In the study of migration in May, one must deal almost entirely with the 11 p. m. weather observations, for towards the latter end of migration the movement is for the most part by night. It is true that a few birds, the Warblers for instance, move a little during the daytime, passing slowly from tree to tree; but short distances only are made in these journeyings, leaving the bulk of the movement to be performed at night.

During the night of May 3 but few movements took place, and more than half of these were around Saint Paul and to the northward, where the influence of the low area in Manitoba was already beginning to be felt. The full advance was postponed until the next night, which was one of great movement over most if not all of the country between Saint Louis and Manitoba. The districts which furnished but nine records for the night of May 3, on the next night showed nearly seventy. The wave seems to have been most pronounced in Iowa, northern Illinois, southern Wisconsin, and at Saint Louis, with a heavy wave in Manitoba and another in northern Texas; but it is not unlikely that this seeming volume was due in part to the greater number of observers, for in each district the number of records of this wave was about proportionate to the number and excellence of the observers. It seems probable that to the northeastward the limit of the wave was at Madison, Wis., and thence up the Mississippi to Saint Paul. There is a striking similarity in the species which were reported from the stations between Saint Paul and Saint Louis, but while the northern stations reported the first males, Saint Louis reported the first females and bulk. Nearly one-half of the record is made up of notes on the Baltimore Oriole, Orchard Oriole, Rose-breasted Grosbeak, Indigo Bunting, Bobolink, Catbird, and Redheaded Woodpecker. No less than twelve records of the Baltimore Oriole were sent from six different States. These species would now be looked for in vain in the notes from Manitoba. A great bird wave was felt there, it is true, but the species composing it were totally different, being those, like the Yellow-rumped Warbler and White-crowned Sparrow, which passed through the central district some weeks before. As in the great wave studied in March, about half as many notes were reported the day after the wave had passed (in this case May 6), but these notes came from the same places as the day before, and were in ones and twos, indicating that they treated of species which arrived the day before but escaped notice. The only exception to this was in northeastern Wisconsin, where the notes indicated a large local wave; but, even here, it seems more likely that the observer was unable to be in the field May 5, and consequently did not see the arrivals until the next day.

The period described above was followed by a north wind. The low area had passed east of the Mississippi Valley, and was followed by colder and at the same time cloudier weather. During May 7 and 8 there was not a record of the whole eighty with a S., SE., or SW. wind. But the birds did not stop. There seems to have been a regular though not rapid advance, for on the night of May 6 there were thirty-six records, every one with N. or NW. wind and cloudy sky. Had this state of things lasted but a single night, one might be inclined to regard the records as mistakes on the part of the observers, but the whole eighty records for the two nights can not be wrong, and the inference is that during the latter part of migration there is no night so unfavorable but that some migration takes place.

The least movement of the seven nights under consideration took place on the night previous to May 9. A low area had developed two days before in Manitoba and had passed across Lake Superior, becoming central at Port Huron May 8, at 11 p. m. It had produced a great rise of temperature (5° to 11°) in the Upper Mississippi Valley—so much so as to make this section actually warmer than the middle portion. At La Crosse the thermometer registered 70°; at Saint Louis, 65°; Omaha, 69°; Little Rock, 66°; Bismarck, 55°; Fort Elliott, 53°; but the area extended so far north that the south wind it caused was of too short duration to start migration. The notes received came from places where the southerly winds were felt, principally in northeastern Illinois, with the single exception of a batch of records from central Iowa, where a northwest wind prevailed. The weather over the whole of the district was clear, with an average barometric pressure of about 30 inches.

In western Nebraska and eastern Colorado the barometer, though high, was falling, and during the daytime of May 9 it fell rapidly. At Yankton, during the sixteen hours previous to 11 p. m., May 9, the pressure fell .34 inch to 29.74 inches. Thus the low area developed right in the Mississippi Valley, and its influence was speedily felt, bringing on southerly winds and sending northward almost the last great wave of the spring migration. The temperature did not vary much from that of the night before, except to rise a little in the immediate vicinity of the low area and to fall at La Crosse and northeastward; the sky was mostly clear; the wind variable—the low area not having had time to fully affect the winds. All the records came from places where the winds were southerly—consequently from the cloudy places—so that although the larger part of the Upper Mississippi region was clear, the cloudy records form 73 per cent. of the whole number. Another thing was noticeable, namely, that notwithstanding the fact that the sky was cloudy, yet the dew point was many degrees below the temperature, showing that the air was very dry. The average of the difference between the temperature and dew point of the records of May 5 is only four degrees, with a range from 0° to 8°, showing that the air was almost fully saturated with moisture. The records of May 11 show an average difference of fifteen degrees, with a range from 11° to 33°. Thus it will be seen that the humidity of the atmosphere has little or no effect on migration, and can be left out of future investigations.

This wave of the night of May 9, like the one of five days before, was very extended. Along the western shores of Lake Michigan, where the weather had been cold and disagreeable for the four days previous, it was most strongly felt. Then little or no movement was noted until the Mississippi was crossed. Here, from Keokuk to Moorhead, the night was marked by great activity, and the movement extended in a southwesterly direction as far as southern Nebraska and Kansas. No notes were sent from southern Dakota, and it is probable that almost no migration took place in that Territory, as certainly none did in Manitoba. Nor was the movement of special importance south of Keokuk. The influence of the low area had not yet extended south of that point, and it was not until the next night that a full bird wave occurred at Saint Louis. The above is an excellent example of a bird wave and a warm wave both working from the north southward.

Recapitulating, in the same manner as was done for the March notes, it is found that the temperatures at which migration was made are as follows: At 46° there were 29 records of firsts; at 52°, 11 records; 55°, 116 records; 59°, 66 records; 63°, 70 records; 67°, 9 records. Thus, instead of a favorite temperature ranging from 37° to 41°, as was the case in March, it is found that from 55° to 60° is the favorite temperature for nearly the last wave. Indeed, 63° is about the average temperature at which the real rear guard, composed of Cuckoos, Whippoorwills, etc., usually moves.

In cloudy weather there were 184 records, and in clear weather 113; or 62 per cent. in cloudy to 38 per cent. in clear weather, as against 60 and 40 per cent., respectively, in March. The records with relation to the wind are as follows: Wind N., 64 records; NE., 0; E., 6; SE., 47; S., 49; SW., 42; W., 23; NW., 33; or for N., NE., and NW., 97; with 138 for S., SE., and SW.

The average barometer for 298 records was 29.88 inches, against 30 inches in March.

A STUDY OF THE "BIRD WAVES" WHICH PASSED UP THE MISSISSIPPI VALLEY DURING THE SPRING OF 1884.

The following study, for obvious reasons, must be considered as an experiment, known to be incomplete, and wanting in many essential details. The project was not thought of until migration had commenced; no instructions were issued to observers to note bird waves; only a few sent in any specific notes on the subject, and most of the information relating to it had to be picked out of a mass of notes not pertaining to the question, and so intimately connected with other themes as to be difficult of separation. Under such adverse conditions no attempt would have been made to study the bird waves were it not for the extreme importance of the subject. It is during the nights of bird waves that the bulk of migration takes place. This is especially true of fall migration, though to a large extent of spring also. To study migration successfully it must be studied when most active. Moreover, it is on bird waves that the action of the weather is most apparent; hence, these waves furnish the readiest means of studying the relation between meteorology and migration. The greatest drawback is met with in the difficulty of accurately observing and reporting bird waves. It is by far the hardest part of the field work in the study of migration, and requires more time and more constant presence in the field than most observers can give.

The only station at which the successive bird waves were accurately and fully noted was that at Saint Louis, Mo, where Mr. Otto Widmann, the most careful, competent, and painstaking observer in the district, spent nearly the whole time in the field. For the present, then, all that can be done is to take the bird waves of Saint Louis as a text and see how far they extended, and how the movements of birds at other places agreed with them. From the absence of material, it will be impossible to study all the waves of the Mississippi Valley. Those observed at Saint Louis will be given in full, not only to serve as a basis of comparison, but also to serve as a model for observers in future years.

The expression "*bird wave*" has been used many times. The term is capable of two interpretations; consequently, two methods of study are possible.

(1) A "bird wave" may be considered to consist of a very large number of individuals, of one or many species, which suddenly invade a certain area. In studying such a wave it is necessary to ascertain the species of which it is composed and the boundaries of the area over which it extends.

(2) Certain species, known to be migrating in company on a given day, may be considered to constitute a "wave," and their progress may be watched from day to day and from week to week.

This latter mode of study is applicable to the earliest waves only, for it is only early in the season, if at all, that the same species which are together in the south keep together during the entire journey. In all the later waves the species migrating in company change from day to day. Hence no attempt will be made to follow waves of this character; and the first, or bird waves proper, will alone be dealt with.

It is usually believed that all birds reach their winter quarters by the end of December, but in this respect the winter of 1883–'84 was exceptional. The fall of 1883 was very warm, and from latitude 39° southward there was no cold weather before Christmas. About this time, however, the real winter set in, and by January 2 it had extended southward to latitude 33°. Hence, fall migration did not end until the first week in January; and since spring migration began in central Mississippi on January 11, but little time was left between the end of the southward and beginning of the northward movement. It is to be observed, however, that the southward movement of January 1 was confined chiefly to the Thrush and Sparrow families, while the northward movement consisted wholly of water-birds. As examples of this late staying of birds at the north the following may be selected: Dr. G. S. Agersborg reported from Vermillion, Dak. (latitude 42° 56′), that "in early January birds were few, probably owing to previous mild weather. On January 5 winter set in, with the thermometer at 34½° below zero, and by the end of the month all our winter residents were here except the Bohemian Waxwing, the Evening Grosbeak, and the Magpie. Purple Grakles and Cowbirds did not leave until December 26, a later date by twenty-seven days than any noted since 1867, when I commenced to record arrivals and departures."

At Saint Louis, Mo. (lat. 38° 40′), the cold spell set in with a snowstorm January 1, causing most of the Bluebirds, Shrikes, Red-tailed Hawks, Red-shouldered Hawks, and Gulls to retreat southward, and bringing down large numbers of Crows.

From Anna, Ill. (lat. 37° 30′), C. W. Butler reported: "Until January 2, I could pick strawberry blossoms growing out of doors and uncovered; and all our winter residents were here in great numbers. But January 2 a heavy storm set in, and on the 4th the mercury was —21°, the coldest day for twenty years. Ducks and a great majority of our winter birds left and stayed away during the cold spell, which lasted through January." Still farther south, H. Nehrling, from Pierce City, Mo. (lat. 36° 56′), reported that "Harris's Sparrow, the Fox Sparrow, the Song Sparrow, and Towhee, after being common in the early winter, all left about January 1." At Caddo, Ind. Ter. (lat. 34° 11′), the children were barefoot on Christmas Day, and the woods were full of birds and bird song; after the cold spell of January 2 the woods were found still and almost tenantless.

First wave of 1884.—Turning now to northward movements, it is found that the first spring wave occurred at Saint Louis (lat. 38° 40′), in the latter part of January. Its record is as follows: January 25, a warm wave set in which continued until February 5; the warmest day (maximum 67°) was January 30. During this time the creeks were free from ice after the 29th, and the ice broke up in the Mississippi. The first wave brought the advance guard of Robins (*Merula migratoria*), Red-winged Blackbirds (*Agelaius phœniceus*), Purple Grackles (*Quiscalus quiscula*), Mallards (*Anas boschas*), Sprig-tails (*Dafila acuta*), and Canada Geese (*Branta canadensis*). The Bluebirds (*Sialia sialis*), Shrikes (*Lanius ludovicianus*), Red-tailed Hawks (*Buteo borealis*), Red-shouldered Hawks (*Buteo lineatus*), and Gulls (*Larus argentatus smithsonianus*), which had left during the coldest term, returned. Many Gulls passed, going north, and the vast multitude of Crows (*Corvus americanus*), whose numbers had swelled to something near 50,000 during the first half of January, decreased rapidly after the 26th.

This being the state of affairs at Saint Louis, it remains to determine the boundaries of the wave. As would naturally be expected, a large stretch of country south of Saint Louis was affected. In the extreme south, in Mississippi, the same wave of warm weather was found, but since water-fowl and other birds had been passing and repassing all the month no special effect on migration was noted. On reaching southern Illinois a state of things exactly similar to that at Saint Louis was found. Thus at Anna, Ill. (lat. 37° 30′), the "Ducks, which had left January 2, began to return and remained off and on during February, which was variable, raining and freezing alternately" (C. W. Butler). West of Anna, at Pierce City, Mo. (lat. 36° 56′), on January 30 and 31, the Robins and Bluebirds, which had been sent south by the cold of January 2, returned; and large flocks of Red-winged Blackbirds passed north, followed a day or two afterward by large flocks of Canada Geese, Brant, Snow Geese, Mallards, Pintails, and Teal. Even as far southwest as Caddo, Ind. Ter. (lat. 34° 11′), the same wave was felt. It began there January 24, but was not decidedly felt until the 28th. It entirely obliterated all signs of winter and started the first spring migration. Ducks and Geese moved a little, and most of the birds deserted their thick winter coverts, appearing in town and on the prairie, while all the songsters burst forth in full spring melody. Blackbirds, both Red-winged and Cowbirds, increased decidedly; grass started everywhere, and one wild flower was found.

Directly east of Saint Louis the wave can be traced to Odin, Ill. (lat. 38° 39′), where the atmosphere was warm from January 27 to February 4. The snow had all gone, and Geese appeared January 31, followed by Ducks February 2. West of Saint Louis the migration of Bluebirds was observed at Mount Carmel, Mo. (lat. 38° 45′), and of Robins and Geese at Glasgow, Mo. (lat. 39° 14′).

Above are the limits of this wave, which, although of great extent to the south, east, and west of Saint Louis, proceeded no farther north. A study of the Signal Service report shows the reason for this. Although the warm wave was felt for several hundred miles north of Saint Louis, yet its power was not sufficient to produce any marked thaw or breaking up of the streams. Indeed, even in the latitude of Saint Louis, no marked effect was observed, except in the lowlands. Stations in the vicinity of Saint Louis, and only 30 or 40 miles farther north, did not feel its influence. And the same is true in the West. In Kansas there was no movement of birds. At Manhattan (lat. 39° 12′), though in the same latitude, there was no migration, and the Signal Service reports show that the nights were cold, and winter reigned until a month later. An apparently accidental movement was reported from Unadilla, Nebr. (lat. 40° 53′, F. C. Kenyon), where Geese arrived January 31, and Ducks February 2; but it is possible that these birds were driven back from the north, as both Ducks and Geese had been reported January 11 from Vermillion, Dak. (lat. 42° 56′)—a locality where they had never before been seen in winter. A single record of Robins and Bluebirds came from Carlinville, Ill. (lat. 39° 19′), February 2, with the statement that no others were seen for two weeks (Chas. W. Robertson).

Second wave.—The second wave began at Saint Louis during the night of February 18, and was cut short on the 19th at 11.30 a. m. by a fierce snow-storm from the northwest. On the 18th, in the afternoon, the temperature rose rapidly with a good breeze from the southeast which moderated in the evening, but the temperature remained at 50° all night. The sky was clear in the evening, but cloudy in the morning. This wave brought more Robins, Bluebirds, and Purple Finches; many Mallards, Sprigtails, Green-winged Teal, and Canada Geese; it took off about half the Tree Sparrows (*Spizella monticola*), and brought the first migrants of the Goldfinch (*Spinus tristis*), White-crowned and White-throated Sparrows (*Zonotrichia leucophrys* and *albicollis*), Field Sparrows (*Spizella pusilla*), Song Sparrows (*Melospiza fasciata*), Swamp Sparrows (*Melospiza palustris*), Fox Sparrows (*Passerella iliaca*), and Chewinks (*Pipilo erythrophthalmus*). It appears to have been a local wave. No other stations reported any movement whatever on those dates. There were, to be sure, a few records of apparently irregular occurrences; a single Bluebird was seen at Newton, Iowa (lat. 41° 42′), but none afterwards for three weeks; a few Canada Geese were reported at Osceola, Ill. (lat. 41° 15′), February 20, and a few Ducks and Geese at Linwood, Nebr. (lat. 41° 22′), between February 20 and 25. The weather reports show that this warm wave was felt even beyond latitude 41°, but such cold weather had preceded it that it could not break the bands of winter and produce a condition of affairs that should invite birds to further migration.

Third wave.—A sudden rise of temperature at Saint Louis on February 25 and 26, again started the migrating hosts northward. There was not much of a "bird wave," but great movements of Geese took place on the first day, and of Ducks on the second. Red-winged Blackbirds and Robins increased, and the first Snow Geese appeared, together with the first Turkey Buzzard, Sparrow Hawk, Rusty Grackle, and Ruddy Duck. The first frogs and mosquitoes were noted.

Although the Signal Service reports show that this warm wave was quite extended and powerful, yet it was of too short duration to cause much movement among birds. The scouts of some of the hardier species moved a little farther northward, keeping mostly along the larger rivers. Robins and Bluebirds advanced up the Mississippi river to Quincy, Ill. (lat. 39° 55′); Bluebirds and Canada Geese were seen at Richmond, Iowa (lat. 41° 26′), while large flocks of Robins and Bluebirds appeared at Hillsborough, Ill. (lat. 39° 12′), and also at Griggsville, Ill. (lat. 39° 43′).

Until March 1 winter reigned supreme over all the land north of latitude 40°, and from February 27 to March 9 its icy fingers again closed around Saint Louis, driving all the Ducks south on March 2, and bringing on a "second winter."

The next period has been marked "Indeterminate" in the record. It is neither a stand-still nor a period of much movement. It extends from March 9, when the "second winter" was brought to a close by a south wind, to March 16. During this time there was a continual though slight northward movement at Saint Louis, and much movement in the region just north of it; and, what was of more importance, a general advance in the line of open water, inviting a forward march and preparing the way for the immense movements of the following week. At Saint Louis the arrivals were as follows:

March 9 the first Ducks returned and passed north, followed two days later by large flocks of Red-winged Blackbirds (both male and female), Purple and Rusty Grackles, and the first individuals of the Killdeer (*Ægialitis vocifera*), Meadowlark (*Sturnella*), and Flicker (*Colaptes*). On March 12 came the first Snipe (*Gallinago*), and on the 16th the first Cranes (*Grus mexicana*).

Thus, there was little change in the species present at Saint Louis, but a great increase in the number of individuals. This increase was less apparent at Saint Louis than at more northern points. The hosts of birds sent south by the inclement weather did not halt, on their return, at their former resting places, but pushed rapidly forward and spread over many miles of new country. The onward movement dates from about March 12, and during the remainder of the "indeterminate" period (that is, to March 16) Ducks, Geese, Robins, Bluebirds, Blackbirds, Meadowlarks, and Killdeer were found over all of northern Illinois and the southern edge of Wisconsin, all of Iowa and eastern Nebraska, while a few scouts, keeping close to the Mississippi river, followed it nearly to Saint Paul. The general dispersion of the birds at this time can be seen from the fact that seventy-two records of the arrival of Ducks, Geese, Robins, and Blackbirds were received from the region indicated.

Fourth wave.—At Saint Louis the first rain of the season occurred March 17, after a warm night (thermometer 56°), with a light south wind. Winter ended, and spring began with a sudden start of vegetation and an awakening of insect life. Many birds arrived during the night, and others were moving all the morning. The bulk arrived of the Robin, Flicker, Meadowlark, Bluebird, Chewink, Purple Grackle, Rusty Grackle, Red-winged Blackbird, Song Sparrow, and Blue-winged Teal. There was an increase of Wilson's Snipe, White-crowned, White-throated, and Field Sparrows. The first arrivals appeared of the Phœbe (*Sayornis phœbe*), Pectoral Sandpiper (*Tringa maculata*), Cowbird (*Molothrus ater*), Field Plover (*Bartramia longicauda*), and the Little Yellow Rail (*Porzana noveboracensis*), while the bulk of the Tree Sparrows (*Spizella monticola*) departed.

Since the movement in this wave consisted principally in an increase of those species which had already come in the preceding waves, and since few of the stations reported more than the first arrival, it is practically impossible to work up the wave from the notes in hand. There seem to be intimations that the power of the wave was not great, but that its influence was felt more or less for a hundred miles north of Saint Louis and for a great distance west and southwest.

Fifth wave.—March 22; this was next to the largest wave of the season. The night before was warm (thermometer 53°) and cloudy, with a light southeast wind. The day was cloudy and threatening, with an increasing southeast wind. Many birds arrived during the night and others were moving all the forenoon. The following birds attained the height of the season—that is, the period of greatest abundance: Robin, Flicker, male Red-winged Blackbird, Purple and Rusty Grackles, Chewink, transient Bluebirds, transient Purple Finches, and Song Sparrows. The bulk arrived of the Shrike, Phœbe, and Wilson's Snipe; and an increase was noted in the White-throated, Field, and Swamp Sparrows, male Cowbirds, and Red headed Woodpeckers. The first appeared of the Chippy (*Spizella socialis*), Brown Thrush (*Harporhynchus rufus*), Bewick's Wren (*Thryothorus bewickii*), Grass Finch (*Poo-*

cætes gramineus), Savanna Sparrow (*Ammodramus sandwichensis savanna*), and the Mourning Dove (*Zenaidura macroura*). There was also great movement among the Hawks and Ducks, and among the Waders of the genus *Totanus*. To appreciate the full effect of this wave, observations must extend over nearly the whole of the Mississippi Valley north of Saint Louis. The warm wave was felt almost to British America, and everywhere it started the birds northward. Owing to lack of notes the movements in the immediate vicinity of Saint Louis cannot be followed. The few stations in that section that have furnished reports made no mention of any special movement and noticed but few arrivals, the principal one being that of the Brown Thrush. To the northward, however, the case was very different. The warm weather reached Iowa the following day (March 23) and the general character of the reports from Iowa and southern Wisconsin is well expressed by the following remarks from the observer at Waukon, Iowa (lat. 43° 15′):

"We had a pleasant fall, and a severe winter until the middle of March. Since then it has been mild and pleasant until about April 1. Spring really began about March 23, and the first wave of birds came then. That was the greatest day for migration of birds I ever saw. The bulk of Robins, Bluebirds, Ducks, and Geese came, and hundreds of Blackbirds came also." (E. M. HANCOCK.)

Between Waukon and Saint Louis most of the reports mention arrivals which agree very closely with the birds of the fourth wave at Saint Louis. There is not enough uniformity in these reports, however, to indicate with positiveness that the birds of the fourth wave spread over this section during the night of March 22, but there is a general tendency in this direction, so that it may be said that the arrivals reported March 23 over much of Iowa and southern Wisconsin were such as would have been noted had the fourth wave passed over during the previous night. The principal exceptions occurred along the courses of the larger rivers, where the arrivals were somewhat earlier (that is, about March 20). North of Waukon the movements of the first wave only were recorded. In favored localities the effects began to be noticed March 23, but in the majority of cases the following day witnessed the great advance. The results of this wave are easily traced to latitude 45°, and in the neighborhood of the Mississippi and Missouri rivers to latitude 46°. Some idea of the magnitude of the flight of birds which took place March 23 may be had from the report from Heron Lake, Minnesota (latitude 43° 48′), with which the report from Storm Lake, Iowa (latitude 42° 37′), agrees almost exactly. It was the first wave of real migration, and brought Mallards, Pintails, Gadwalls, Widgeons, Big and Little Scaups, Golden-eyes, Red-heads, Canvas-backs, Butter-balls, Green-winged Teal, Hooded and American Sheldrakes, Spoon-billed Ducks or Shovellers, Brant, Herring Gulls, Coots, Killdeer Plovers, Ravens, large numbers of Blackbirds, and one Meadowlark. Most of the species appeared in great numbers and some of the Ducks in clouds. Most of the Ducks came from the west, being probably a part of the Missouri valley flight. By way of comparison, to show how little can be judged of the migration at one place by that of another, let us examine the state of affairs at Manhattan, Kans. (directly west of Saint Louis), in latitude 39° 12′. Here, during the first week of March, no arrivals were noticed. March 8 the first birds came, namely, Geese and Ducks—Mallards, Canvas-backs, Red-heads, and Green-winged Teal were particularly abundant. The first Killdeer were seen on the 11th; two more on the 13th, at which date Meadowlarks appeared. It seemed as if spring had really come, but on March 13 a polar wave arrived and all was changed. The fifth wave was not felt here in the least, the weather being cold and snowy. To the southwest still another condition of things existed. At Caddo, Ind. Ter. (lat. 34° 11′), on March 22, the weather was hot and dry, with continuous south winds, more like summer than spring. Fewer birds were present than at any time since February 1. The commonest species was the Savanna Sparrow. There were no Juncos, Tree Sparrows, White-throated Sparrows, White-crowned Sparrows, Harris's Sparrows; Cowbirds, Red-winged Blackbirds, Meadowlarks, Ducks, or Geese. A few individuals of each of these species may still have lingered, but the bulk left some days previously, and none were seen on the 22d. There was very little vegetation, owing to lack of rain.

The study of this fifth wave leads naturally to the following statements concerning bird waves in general: The movements of bird waves are governed by those of atmospheric waves. Since a warm wave takes several days to pass from one end of the Mississippi Valley to the other, it must not be supposed that the whole of a bird wave is included in a single night. In the case of small waves, which are almost local in character, the whole effect may be felt in one night; but waves ordinarily occupy the whole of two days, and often three or four. It must not be supposed that a bird wave consists of the same species of birds at all places where its effects are felt. Above, when speaking of the birds of the fourth wave, the species which were moving at Saint Louis at this time were alone referred to. The ducks which arrived at Heron Lake, Minnesota, March 24, were as truly a part of the "fifth wave" as the Brown Thrushes and Bewick's Wrens which came to Saint Louis on the 22d. For further remarks concerning bird waves the reader is referred to the article on the Kingbird in the systematic portion of this report.

For the instruction of observers, a copy of the "synopsis" of spring migration (in 1884) at Saint Louis, furnished by Mr. Widmann, is subjoined. During the migration season Mr. Widmann sent reports every few days, but in this synopsis he has presented the substance of the same in condensed form and in such a graphic manner that the more important movements of the bird waves can be seen at a glance, together with their relation to the lesser movements of migration. It is greatly to be desired that at the close of the season each observer should supplement his regular reports with a synopsis of this sort. In the synopsis the following abbreviations have been used: F.=the first individual seen; B. A.=the arrival of the bulk; B. D.=the departure of the bulk; L.=the last individual seen; H.=the height of the season, or the period when the species is most abundant; T. V.=transient visitants. Thus when "B. A. Catbird T. V." is spoken of, it means the arrival of the bulk of Catbirds which do not intend to remain to nest, but are passing through to their more northerly breeding grounds.

Synopsis of Migration at Saint Louis from January 1 to May 27, 1884.

By Otto Widmann.

Jan. 1. Snow storm.
2.
3.
4.
5. Coldest period; minimum temperature—21° Fahr. on the 5th. Mississippi full of floating ice.
6.
7.
8.
9.
10.
11. Ground covered with snow.
12.
13.
14. Mississippi gorged.
15.
16.
17.
18. Moderately cold.
19.
20.
21.
22. Ther. 56°; snow disappeared; first flock of Geese seen. Mississippi entirely frozen.
23. Snow Buntings gone.
24.
25. Crows begin to disperse.
26.
27.
28.
29. Warm wave. Gulls return.
30. Ther. 67°. First Ducks (Mallards and Sprigtails) and the first Robins and Red-winged Blackbirds go north; Gulls go north in migrating wedge; Bluebirds and Shrikes begin to return. Creeks free from ice; ice in the Mississippi breaking.
31.
Feb. 1.
2. First Purple Grackle; Canada Geese go north; Red-tailed Hawks at stand.
3. 75–85 Herring Gulls go north.
4. First green shows itself on the ground.
5. Large flocks of Ducks go north.
6.
7.
8.
9.
10. Cold, dark, damp weather, with rain and snow.
11.
12.
13.
14.
15.
16.
17.
18. South wind. Birds move; flocks of Geese go north; also Mallards, Sprigtails, and Green-winged Teal.
19. Increase of Bluebirds, Goldfinches, and Black-capped Chickadees (T. V.).
20. First Fox Sparrow, Chewink, White-throated, White-crowned, and Field Sparrows.
21. First Robin at stand. Decrease of old Purple Finches.
22. Ducks and Geese in many flocks go north.
23. Cold winds. Robins in flocks. Bald-headed Eagle, Song, and Swamp Sparrow.
24. Tree Sparrows have decreased at stands, but are found in large migrating flocks in the lowlands.
25. Ther. 58°. A great day for wandering Geese. First Snow Goose. Sudden rise.
26. Ther. 56°. Great day for wandering Ducks. First Turkey Buzzard, Sparrow Hawk, Rusty Blackbird, and Ruddy Duck; increase of Red-winged Blackbirds and Robins. First frogs and mosquitoes.

Feb. 27. Ther. 19°.
28. Ther. 7°. Ground bare; Ducks remain in marshes.
29. Slight rise.
Mar. 1. Falling temperature; snow-storm.
2. Cold; snowing again. Ducks go south.
3.
4. Second winter.
5. Cold northerly winds, dark, gloomy skies.
6. Sleet; ground covered; watersheets frozen hard, and the Mississippi full of floating ice.
7.
8.
9. Thawing begins; first Ducks go north again.
10. General thaw; wind high, southeast. Ducks go north.
11. Falling temperature after a warm night. Great numbers of Ducks on the marshes. First large flocks of Purple Grackles, Red-winged Blackbirds (both male and female), and Rusty Blackbirds; first Killdeer and Meadowlark; a large flock of Robins with Flickers.
12. Cold west wind.
13. Wind southeast. Ducks move. First Wilson's Snipe; first song of Robin, Chewink, and Song Sparrow. The Black Snowbirds (Junco), Purple Finches, and Tree Sparrows are excited; Swamp Sparrows increased.
14. Cold north wind.
15. Rising temperature, followed by a mild, clear night with light wind southeast, but no arrivals. Temperature at Saint Louis, 54°; at Cairo, 47°; wind north.
16. Wind southeast. Geese and Ducks are on the move. First Cranes.
17. First rain of the season, after a warm night. Ther. 56°; wind light, south. Winter ends, and spring begins with a sudden start of vegetation and awakening of insect life. Birds have arrived during the night and others were moving all the morning. Bulk arrive of Robin, Flicker, Meadowlark, Bluebird, Chewink, Purple Grackle, Rusty Blackbird, Red-winged Blackbird, Song Sparrow, and Blue-winged Teal. An increase of Wilson's Snipe, White-crowned Sparrow, White-throated Sparrow, and Field Sparrow. First Phœbe, Pectoral Sandpiper, Cowbird, Upland Plover, and Little Yellow Rail.
Bulk departure of Tree Sparrow.
18. Rain; wind east. Frogs noisy; turtles on logs.
19. Rain; wind west to northwest. Vegetation progressing rapidly. Cranes go north.
20. Cool; wind northwest to north. Elms and maples open blossoms. Geese go north.
21. Rising temperature; wind northwest to east. First Swan.
22. Night: warm; thermometer 53°; cloudy; wind light, southeast.
Day: cloudy, threatening; increased southeast wind.

GRAND BIRD WAVE.

Many birds arrived during the night, and others were on the move all the forenoon.
H. Robins, Flickers, Red-winged Blackbirds (males), Purple Grackles, Rusty Blackbirds, Chewinks, Bluebirds (T. V.), Purple Finches (T. V.), and Song Sparrows.
B. A. Shrikes, Phœbe, and Wilson's Snipe.
Increased: White-throated Sparrow, Field Sparrow, Swamp Sparrow, Cowbird (male), and Red-headed Woodpecker.
F. Brown Thrasher, Chippy, Bewick's Wren, Grass Finch, Savanna Sparrow, Mourning Dove.
Great movement of Hawks, Ducks, and Yellow-legs.
23. Cool; wind northwest; clear. First songs of Brown Thrush, Chippy, and White-throated Sparrow.
Mating and song of Chewink, Robin, Bluebird, Shrike, Cardinal Grosbeak, Carolina Wren, Tufted Titmouse, Junco, Purple Finch, Fox Sparrow, Song Sparrow, Field Sparrow. Tree Sparrows are scarce. English Sparrow lays first eggs.
First bat seen; winged insects appear; also ants and worms.
24. Rain all the morning. P. M. clearing; wind shifting to southwest and northwest. Birds do not move until 5 p. m., when Ducks and Blackbirds go north.
F. White-bellied Swallows go north at 5.30 p. m.
F. Purple Martin in sight at 5.45 p. m.
25. Sultry, with showers and hailstones; wind south, turning to west, high during the afternoon. No arrivals except Martins.
B. D. White-throated Sparrow (old), Rusty Blackbird, Mallard, Sprigtail, Baldpate.
Decreased: Robins, Flickers, and Blackbirds.
Numbers of Hawks go straight north. (Bald-headed Eagle, Marsh Hawk, Sparrow Hawk).
No Tree Sparrows seen to-day. F. Butterfly going north.
Early shrubs, such as *Ribes* and *Syringa*, put forth leaflets.
26. Beautiful day; wind west to northwest, abating; thermometer 60°, after a windy clearing up night. No arrivals.
27. Night: clear; wind light, south, warm; thermometer 58°. Birds move.
Day: wind increasing southeast.
B. D. Junco, Purple Finch, Fox Sparrow, Song Sparrow.
F. Winter Wren, Ruby-crowned Kinglet, Yellow-bellied Woodpecker, Golden-crowned Kinglet, Large-billed Water Thrush.
Increased: Chippy (male), Brown Thrasher, Brown Creeper.
F. Double-crested Cormorant.
28. Night: stormy.
Day: wind high, west to northwest.
29. Wind north.
30. Wind northeast shifting to southeast; calm. F. Female Purple Martins.
Swans, Cranes, Ducks, and Hawks go north.
31. Night: clear, warm; wind southeast, cloudy toward morning. Birds move.
Day: Cloudy, rainy, warm; wind southeast.
B. D. Robin, Flicker.
B. A. Chippy (male), Bewick's Wren, Chewink (T. V.), Brown Creeper, and the genera *Numenius*, *Rallus*, and *Porzana*.
Increased: Brown Thrush, Phœbe (T. V.), Cowbird (female).

Apr. 1. Night: Heavy rain; wind southeast. Day: Wind increasing, west, falling temperature.

F. Hermit Thrush.

2. Cold blast from northwest; gloomy.

3. Wind light, northwest; clear; cool night; hoar frost.

4. After a cool, frosty night, day clear, with light northwest wind.

F. White-browed Yellow-throated Warbler.

Decrease: Junco, Chewink (T. V.).

L. Fox Sparrow already gone.

B. A. Cowbird, Kingfisher, Double-crested Cormorant, Yellow-bellied Woodpecker.

5. Wind northeast; rain; cloudy.

6. Hazy; wind east. Vegetation progressing rapidly, especially grasses.

Flowering: *Populus*, *Salix*, *Magnolia*, *Viola*, *Trillium*.

Leafing: *Sambucus*, *Syringa*, *Lonicera*, *Melia*, *Larix*.

7. Cool; cloudy; high west and northwest wind.

8. Cool; cloudy; high west and northwest wind.

9. Cool; cloudy; high west and northwest wind.

10. Cool; cloudy; high west and northwest wind.

11. Cool; wind strong, east. Loons go north.

12. Rain; wind east to southeast.

13. Rising temperature; wind southeast. In afternoon birds begin to move. Ducks and Geese go north.

F. Chimney Swift, Pelican.

Increase: Purple Martin.

14. During night light thunder-storm and rain. Birds move.

Day: Sultry; thermometer 72°; wind south.

Departed: Winter Wren, Yellow-bellied Woodpecker.

L. Canada Goose; Snow Goose.

B. A. Brown Thrush, Chippy (T. V.), Hermit Thrush, Blue-gray Gnatcatcher, Ruby-crowned Kinglet.

Increase: Yellow-rumped Warbler, Chimney Swift, Mourning Dove, Purple Martin.

F. Cœrulean Warbler, Blue-yellow-backed Warbler, Mockingbird.

H. Cowbird, Double-crested Cormorant, Brown Creeper.

15. Night: Warm; wind light, southwest.

Day: Falling temperature; wind shifting to west and northwest.

F. Cliff Swallow, Rough-winged Swallow.

16. Cool; wind northwest, abating in evening.

17. Night: Clear, calm, with light east wind. Birds move.

A warm day; wind increasing, east.

F. Black and White Creeper, Redstart, White-eyed Vireo, Golden-crowned Thrush, Yellow-throated Vireo.

B. A. White-throated Sparrow (old ones in high plumage), White-crowned Sparrow, Yellow-rumped Warbler.

18. Night: Cloudy, rainy, calm. Birds move.

Day: Clearing, sultry; wind southeast, light.

F. Kingbird, Maryland Yellow-throat, Red-poll Warbler, Prothonotary Warbler.

H. White-throated Sparrow (old).

19. Night: Dark, misty, calm, warm. Birds move.

Day: Overcast, sultry; wind east, light, shifting in afternoon to north, with rain.

F. House Wren, Golden Warbler, Warbling Vireo, Wood Thrush.

H. Brown Thrush, Chippy, Yellow-rumped Warbler, Swamp Sparrow.

Increased: Golden-crowned Thrush, Blue Yellow-backed Warbler, Cœrulean Warbler, Savanna Sparrow, Chimney Swift, Mourning Dove.

B. D. Hermit Thrush, Robin (female).

L. Song Sparrow, Fox Sparrow.

Leafing: Maples, Elms, Poplars, Hickory. The ground in the woods is covered with flowers; Cherry and Pear trees in full bloom, and Apple buds ready to open.

20. Cold; wind north; dark, misty.

21. Cold; wind north; dark, misty, rainy.

22. Cold; wind north; dark, misty, rainy.

23. Cold; wind north; dark, misty. About a dozen strange Martins crowd into the boxes to-night. They seem to be refugees from the north, looking lean, and some are barely able to fly.

24. Cold; wind north; clearing. In afternoon rising temperature. The strange Martins return to boxes in the evening.

25. Night: Clear, calm, but cooling off to light hoar frost. Birds leave.

Day: Clear, calm; wind north, light.

No arrivals (except F. Catbird, one, and F. Lark Finch, one), but of departures many. The Martins from the north leave. B. D. Brown Thrush (T. V.), Chippy (T. V.), Yellow-rumped Warbler, White-throated Sparrow (old), Wilson's Snipe. A Yellow-bellied Woodpecker (male), which had put up at Laclede Park since the 19th, also disappeared.

26. Night: Warm, clear; thermometer 57°; wind east by south. Birds arrive.

Day: Fair; increasing south wind; thermometer 75°.

B. A. Lark Finch, White-eyed Vireo, Yellow-throated Vireo, Blue-gray Gnatcatcher (T. V.), Blue Yellow-backed Warbler (female), Golden-crowned Thrush (T. V.), Red-poll Warbler, Redstart, Cœrulean Warbler, Pine-creeping Warbler, Wood Thrush (male), Red-winged Blackbird (female), Kingbird (male and T. V.).

Increased: Maryland Yellow-throat (male), House Wren (male), Golden Warbler (male).

F. Olive-backed Thrush, Small-billed Water Thrush, Yellow-breasted Chat, Black-throated Bunting, Baltimore Oriole, Rose-breasted Grosbeak, Red-eyed Vireo, Black-throated Green Warbler.

B. D. Ruby-crowned Kinglet, Swamp Sparrow.

27. Night: Warm, thermometer 67°; threatening, with strong southeast wind.

Day: High wind from southwest; clearing. No change (except first flock of high-dress Goldfinches).

28. Night: Clear, becoming cloudy; wind light, west, shifting to northeast and southeast. Thermometer 60°. Birds move.

F. Orchard Oriole (male), Kentucky Warbler, Bell's Vireo, Indigo-bird (male), Maryland Yellow-throat (female).

B. A. Maryland Yellow-throat (male), Goldfinch (male), Baltimore Oriole (male), Rose-breasted Grosbeak (male), Kingbird, Summer Yellowbird (T. V.), House Wren.

Apr. 28. Increased: Black-throated Bunting (male), Cliff Swallow, Barn Swallow, Black-throated Green Warbler.

L. Hermit Thrush.

29. Night: Clear, becoming cloudy; wind light, southeast; temperature steady at 63°.

First hot day; maximum temperature 82° (77° at 6 p. m.). The bird wave struck fully. Incredible number of birds present.

B. A. Catbirds arrived in force (male, female, and T. V.); Black-throated Buntings (male) at stands, and small parties on the wing going east; Olive-backed Thrush and Small-billed Water Thrush in flocks; Goldfinch (female), Indigo-bird (male), Orchard Oriole (old males); Warbling Vireo, Black-throated Green Warbler, Yellow-breasted Chat, Red-eyed Vireo, Red-headed Woodpecker, Black and White Creeper, White-crowned Sparrow.

F. Scarlet Tanager, Wilson's Thrush, Nighthawk, Bobolink (male), Wood Pewee, Traill's Flycatcher, Acadian Flycatcher, Least Flycatcher, Tennessee Warbler, Nashville Warbler, Black-poll Warbler, Worm-eating Warbler, Blue-headed Vireo, Red-bellied Nuthatch, Great-crested Flycatcher, Lincoln's Sparrow, Bank Swallow, Black-crowned Night Heron. Apple trees in full bloom; oaks open flowers.

NOTE.—This enormous volume of bird life seems to have resulted from the combined operation of the following bird wave; the start began in the north, and the warm wave reached Saint Louis the night of the 24th, at which time many birds left, but none arrived. The same warm wave, progressing from the Rocky Mountains eastward, started from El Paso on the 22d, reached Fort Smith and Shreveport on the 24th, Little Rock on the 25th, and the birds which arrived in Saint Louis on the 26th came probably from the southwest. The cold wave hovered over Kentucky from the 20th to the 25th, and no movement can have taken place before that day; but when, on the night of the 28th, the bulk of birds from that quarter (southeast) reached Saint Louis it swelled the number of arrivals (from south and southwest) to this enormous height.

30. Another warm night; thermometer 70°; clear; wind light, south. Birds move.

Day: Hot; thermometer 83°; wind southeast to southwest. More birds left than arrived.

H. Yellow-breasted Chat (T. V.), White-crowned Sparrow, Black-throated Green Warbler, Savanna Sparrow, Red-headed Woodpecker, Goldfinch, White-eyed Vireo (T. V.), Cœrulean Warbler, Chimney Swift.

B. A. Kentucky Warbler, Great-crested Flycatcher, Hooded Warbler, Maryland Yellow-throat (female), Redstart (female).

Increased: Bobolink, Bell's Vireo, Indigo-bird (male), Black-throated Bunting (male), Acadian Flycatcher, Tennessee Warbler, Nashville Warbler, Black-poll Warbler.

F. Yellow-winged Sparrow, Orchard Oriole (two year old male).

L. Shoveller Duck.

May 1. Rain both night and day; clearing in afternoon, with strong west wind.

From May 1 to May 4, a stand-still.

2. Cool; wind northwest; clearing.

3. Cool; wind northeast; in afternoon southeast, with rising temperature.

4. Rain; rising temperature; wind south. Nighthawks move.

5. Night: clear; almost calm; wind southeast to south; warm; thermometer 63°. Birds move decidedly.

Day: Fair; becoming threatening; in afternoon a thunder-storm.

H. House Wren, Maryland Yellow-throat, Summer Yellowbird, Black-throated Bunting (male), Catbird, Chimney Swift.

B. Continued of Olive-backed Thrush, Small-billed Water Thrush, and White-crowned Sparrow.

B. A. Bank Swallow, Wood Thrush (female), Lincoln's Sparrow, Rose-breasted Grosbeak (female), Indigo-bird (male), Baltimore Oriole (female).

Increased: Wood Pewee, Traill's Flycatcher, Orchard Oriole (males two years old), Tennessee Warbler, Nashville Warbler.

F. Black-billed Cuckoo, Hummingbird, Black and Yellow Warbler, Pine-creeping Warbler, Blue-headed Vireo (female), Indigo-bird (female), Orchard Oriole (female), Baltimore Oriole (birds of last year), Blue Yellow-backed Warbler (T. V.), Solitary Sandpiper.

B. D. Goldfinch (T. V. males), Yellow-breasted Chat (T. V.), White-eyed Vireo (T. V.), Yellow-rumped Warbler (young).

L. Red-bellied Nuthatch, flock of Purple Finch (young), Red-poll Warbler.

6. Night: Partly clear; warm; temperature 62°; wind south to southeast.

New arrivals.

Day: Rainy, dark; wind shifting to west; falling temperature.

Many T. V. present.

F. Yellow-billed Cuckoo, Black-poll Warbler (female), Black-capped Flycatching Warbler, Chestnut-sided Warbler.

Increased: White-throated Sparrow (young).

B. A. Black-poll Warbler (male), Black and Yellow Warbler, Redstart (T. V.).

H. Rose-breasted Grosbeak, Orchard Oriole (male), Indigo-bird (male).

7. Night and day: Strong west wind; dark.

8. Night: Clear, fair, cool; wind west to northwest.

Day: Clear, beautiful; thermometer 72°; wind northwest. A great day for wandering Bobolinks.

B. D. Catbird (T. V.), Golden Warbler (T. V.), Goldfinch (female).

F. Yellow-bellied Flycatcher.

9. Night: clear, bright, full moon; wind northwest; thermometer 64°.

Day: Clear, bright, lovely; wind northwest.

H. Bobolink (male), Tennessee Warbler (male), Black-poll Warbler (male), Redstart (female).

B. A. Indigo-bird (female and young male), Orchard Oriole (female), Least Flycatcher, Black-throated Bunting (young males).

F. Orchard Oriole (one-year-old males).

10. Night: Clear, calm; wind northwest; warm; thermometer 69°.

Day: Fair; wind changing to southeast; rising temperature; thermometer 85°.

Full bloom: Oak, Hickory, Walnut.

Many T. V. Warblers.

F. Blue Golden-winged Warbler, Orange-crowned Warbler, Blue Yellow-backed Warbler (young).

B. A. Yellow-winged Sparrow, Cuckoo.

H. Chestnut-sided, Black and Yellow, Black-poll, Nashville and Tennessee Warblers.

May 10. L. Yellow-rumped and Black-throated Green Warblers, Blue-headed Vireo, Swamp Sparrow, Yellow-bellied Woodpecker (female).

11. Night: Clear, calm; wind northwest; warm, thermometer 69° to 64°; moonlight. Birds arrive.
Day: In forenoon bright, in afternoon overcast, rainy; wind north to northeast.
A great day for migration; oak woods full of T. V. birds going north all day. Mourning Doves present in great numbers; White-throated Sparrows (young) in large flocks, and the same of young Olive-backed Thrushes, Bobolinks, Red-winged Blackbirds (female), and Blue Jays in flocks going north; Double-crested Cormorants (young), two parties go north; Nighthawks at great heights; also Waders (species unknown) going north.
T. V. present of Wood Thrush, Warbling Vireo, Rose-breasted Grosbeak, Baltimore Oriole, Red-headed Woodpecker, Scarlet Tanager.
H. Wood Pewee, Traill's Flycatcher, Bell's Vireo.
F. Bay-breasted Warbler, Blackburnian Warbler, Canadian Flycatching Warbler, Summer Redbird (young).
B. A. Purple Martin (young), Redstart (young, one year old).

12. Night: Cloudy, calm; wind northeast; foggy. No arrivals, but decrease of many.
Day: Clearing; in afternoon thunder-storm.
B. D. Wood Thrush (T. V.), Olive-backed Thrush, White-throated Sparrow (young), White-crowned Sparrow, Mourning Dove (T. V.), Red-headed Woodpecker (T. V.), Yellow-breasted Chat (T. V.), Least Flycatcher.

13. Night: Threatening, calm; wind west; rainy.
Day: Falling temperature; cloudy; wind northwest. No new birds. T. V. getting scarce.
B. D. Black-poll, Chestnut-sided, Nashville, and Tennessee Warblers.

14. Cool; wind northwest.

15. Slowly rising temperature; wind west. Yesterday and to-day but few T. V. present.

16. Night: Clear, calm; wind southwest; thermometer 68°.
Day; bright; wind northeast.

17. Night: Clear, calm; wind southeast; thermometer 68°. In these two days birds move and the rear guard arrives.
B. A. Bobolink (female and young male), Alice's Thrush, Black-throated Bunting (female), Mockingbird (young), Barn Swallow (young).
L. Kingbird (T. V.), Traill's Flycatcher (T. V.), Mourning Dove (T. V.), Black and Yellow Warbler, Nashville Warbler, White-throated Sparrow, White-crowned Sparrow, Least Flycatcher, Black-capped Flycatching Warbler.

18. High south wind; thunder-storm.

19. Strong west wind; cool.

20. North wind. L. Lincoln's Sparrow, Bobolink.

21. South wind; clear, calm. F. Connecticut Warbler, Mourning Warbler. L. Tennessee Warbler, Wilson's Thrush, Canadian Flycatching Warbler.

22. South wind. L. Double-crested Cormorant, Solitary Tattler.

23. Wind southeast, shifting to northwest.

24. Wind northwest; cool.

25. Wind northwest; L. Alice's Thrush, Black-poll Warbler.

26. Wind northwest; L. Olived-backed Thrush.

27. North wind; L. Nighthawk (fourteen T. V. go north in the evening).

PROGRESS OF VEGETATION AND AWAKENING OF ANIMAL LIFE IN THE MISSISSIPPI VALLEY DURING THE SPRING OF 1884.

This subject will be treated from the south northward in steps or sections of two degrees each, beginning with latitude 28° and extending to latitude 53°, or over 25 degrees of latitude. Thus it will be seen that the observations cover a tract of country 1,750 miles in length. In studying each section the endeavor has been to make the dates indicate fair averages for the middle of the section. For example, in the section which extends from latitude 38° to latitude 40°, the dates are as exact as possible for latitude 39°. For the southern half they would then be a day or two earlier, and for the northern part somewhat later. It is also intended that the dates shall express average time; for instance, in the appearance of flowers, one observer, in a sunny and well protected nook, finds the "first flower" while the rest of the country is bleak and bare. Another does not consider it proper to record flowers as present until they can be found almost anywhere. In giving dates of flowering, an average has been taken of the several dates received, with a leaning toward the earlier. The same remark applies to the other dates treated in this chapter. The number of observers in the first five sections is so deplorably insufficient for the extent of the country that the dates must be considered as the merest approximations; for the next four sections they are quite full and accurate, while for the last two they are again insufficient. In studying the movements of any species of bird, reference to this part of the report will show with considerable accuracy the conditions under which it was migrating and the prospect for a plentiful food supply.

I. This section (extending from latitude 28° to latitude 30°) contains the extreme southern part of Louisiana and the middle part of southern Texas (the reports from Texas coming from the region of the Rio Grande). In Louisiana, in the spring of 1884, the earliest leaves began to show on briar bushes and willows the first week in February, followed the next week by grass and flowers. This is of course a moist country, while in southern Texas the climatic conditions are different. Vegetation there was much later in starting, owing to the lack of rain. The first rain after September fell March 6, and was followed immediately by the blooming of myriads of plants and the rapid development of leaves previously in bud. Frogs in this part of Texas had but a short winter vacation, being heard both in January and February; while the first in Louisiana was reported March 13, but they must have croaked some time before. The bulk of the insects appeared in both places at the same time, namely, the middle of March. There was no frost in this part of Texas, and in Louisiana the last "freeze" occurred February 15. In Louisiana the first snakes were not reported. In Texas the first rattlesnakes were seen March 16, and other snakes much earlier. The first bat was recorded February 27.*

II. This section (from latitude 30° to latitude 32°) consists of the southern part of Mississippi, central Louisiana, and central Texas. No reports were received from Louisiana, and Mississippi sent but few. In Texas the last frost was recorded February 27, followed, March 3, by the first rain. As in the more southern part of Texas, the first rain immediately started the grass, leaves, and flowers, and by April 1 flowers were in the height of bloom. In Mississippi flowers were plentiful March 25. Rattlesnakes appeared in Texas March 29; and the first snake of the harmless sorts was seen in Mississippi February 11, which is rather an early date. Insects were noted as abundant in Texas March 5, and in Mississippi March 28.

III. This section (from latitude 32° to latitude 34°) includes central Mississippi, northern Louisiana, southern Arkansas, and northern Texas. Of these, Mississippi alone sent reports on vegetation, etc. These reports are as follows: Last frost, February 28; first leaves, February 10; beginning of real foliage, March 24; first frog, February 4; first toad, February 8; first snake, March 21; first insect, February 17.

IV. This section (from latitude 34° to latitude 36°) includes western Tennessee, northern Arkansas, and Indian Territory. Indian Territory alone reported, and the dates for latitude 34° 11′ were as follows:

[* In this latitude several species of bats must remain active, except during severe weather, throughout the entire year.—C. H. M.]

Last snow March 8; ice broke up January 27; frost came out of ground February 1; last frost March 9; grass started February 1, but stopped in a few days, not to commence again until March 1. Leaves of small size could be found on briars February 29, but even April 8 there were not leaves enough on any tree to make shade. The first flower was found February 2, but no more until February 25, and by March 20 seven kinds only had bloomed. The first frogs were heard February 23. But few insects were noted before March 13. This is the record of a strictly prairie country on the eastern edge of the Great Plains.

V. This section (from latitude 36° to latitude 38°) includes western Kentucky, southern Missouri, and southern Kansas. Only Missouri reported, and as follows: Last snow, April 8; last frost, April 9; first grass, March 18; grass high enough for pasturing, April 1; grass plenty, April 27; first frog, March 2; first snake, March 23; and insects very numerous by April 27.

VI. This section (from latitude 38° to latitude 40°) includes southern Illinois, central Missouri, and northern Kansas. This section supplied an abundance of notes. The last snow of winter melted the first week in February, but later snows came in Illinois and Missouri April 7 and April 22. The ice broke in the Mississippi river February 1, and disappeared from ponds March 15. The first rain occurred March 17. Grass started March 22, and was pretty well up April 6, on which day an especially fast growth was made. Flowers appeared in the bottom lands about March 20, and on the prairies March 30; while from the high, dry lands of western Kansas, none were reported until April 4. The height of the season, as indicated by the opening of the apple-blossoms, was April 29. The first leaves were reported March 25; first foliage, April 19; and the opening of the latest leaves May 10. Frogs appeared in Illinois and Missouri March 15, in eastern Kansas March 26, and in the western part of the State not until the 31st. Snakes were reported March 22; toads about the same date, at which date also clouds of insects suddenly appeared.

VII. This section (from latitude 40° to latitude 42°) includes northern Illinois, southern Iowa, and most of Nebraska. Here, also, snow fell April 1, 7, and 8, and in the northern part on April 20. Ice left the streams March 19; frost came out of the ground February 27, and the last frost was recorded May 3. Grass started during the first week in April; leaves a few days later (April 10), but real foliage did not begin to unfold until May 10; the first flowers were seen April 2, and apple trees were in bloom May 8; the first frogs were heard March 22, but in Nebraska they were not recorded until April 11, which date probably is a little late. Snakes were first noted March 27; toads, in the eastern part, April 20, and in the western part, May 2; insects may be supposed to have appeared about March 26, but 'first' dates were given all the way from March 17 to May 9. It is to be regretted that fuller records were not received from the extreme western parts of the district. Such records would undoubtedly show that in moving westward—in ascending and entering the elevated, treeless, and almost rainless plains—all of the records would be later. This, indeed, is intimated by many of the records of vegetation in hand, and is known to be the case with birds.

VIII. This section (from latitude 42° to latitude 44°) includes southern Wisconsin, northern Iowa, southern Minnesota, and southern Dakota. The winter's snow left this section about March 26, but was quickly succeeded by a severe storm April 1, and by another on the 7th, 8th, and 9th, while the frost kept returning and was heavy even as late as May 29. Ice broke in streams March 26, and in lakes about April 6. Grass started April 25, many flowers having already appeared; apple-blossoms opened May 20; leaves started late (May 2), but grew rapidly, the foliage proper beginning May 15. Frogs appeared March 26; insects on the 31st, and snakes April 10, while toads were not recorded till April 26.

IX. This section (from latitude 44° to latitude 46°) includes the central portions of Wisconsin, Minnesota, and Dakota. The winter's snow was all gone, except in sheltered localities, when the storms came the first week in April. Snow fell over the section April 6, and in most places also on the 7th. By April 10 the snow had all gone. Ice left the smaller streams March 26, and passed out of the Mississippi the 30th. April 6 it disappeared from small lakes, but remained in the larger ones until April 13. Grass started in the west earlier than in the east. In Dakota it began to be seen April 7, but was a few days later in Wisconsin. The first leaves appeared May 10, so that here a larger part of the migration took place among bare trees than in the more southern districts. A few flowers, principally the hardy anemone, or wind flower, were out April 10, but even by May 10 there were not many to be found. Frogs became musical April 4. Only two observations were contributed on snakes, one in Minnesota April 2, and the other in Dakota May 3, giving little clue to the correct dates. A single toad was reported April 4, and he must have been a very early individual. Insects appeared April 3.

X. This section (from latitude 46° to latitude 48°) includes the north-central portions of Minnesota and Dakota and the northern part of Wisconsin. The only note contributed is to the effect that the ice left the large lakes April 20.

XI. This section (from latitude 48° to latitude 50°) includes northern Minnesota and Dakota and southern Manitoba. The only observations contributed relate to a few insects seen April 2, and to the revival of frogs April 15.

From further north than this no notes were received except a single one, which stated that the ice passed out of Lake Winnipeg June 1. In addition to the observations above recorded, a few other data have been contributed. The "Gopher"* was first seen at latitude 39°, March 15;

[* *Spermophilus tridecemlineatus* is here meant.—C. H. M.]

at latitude 41°, in the west, March 28; in the east, April 1; at latitude 43°, in the east, April 12; at latitude 45°, in the west, March 28; and at latitude 47°, in the west, March 27, showing that on the plains of the west these animals awakened simultaneously over a district 400 miles in width; while in the better watered, more thickly wooded, and therefore more chilly eastern portion their winter sleep was much prolonged.

Bats were first seen at latitude 29°, February 27; at latitude 39°, March 23; at latitude 42°, March 28; and at latitude 44°, April 15. Turtles moved their sluggish bodies above water at latitude 39° from March 18 to 21, and at latitude 44° from April 20 to 24. The Tree-toad was heard about the same time (from April 27 to May 3) over the country between latitude 40° and latitude 44° 30′.

LIST OF STATIONS AND OBSERVERS FOR 1884.

Name of observer.	Station.	State.	Latitude.
			° ′
C. H. Wood	Moss Point	Mississippi	30 26
Gideon Mabbett	Rodney	do	31 52
A. G. Gale	Jackson	do	32 17
George C. Eyrich	do	do	32 17
Judge R. B. Mayes	Yazoo City	do	32 50
Maj. G. V. Young	Waverly	do	33 34
E. M. Hoke	Water Valley	do	34 08
Dr. Rawlings Young	Corinth	do	34 55
Dr. T. H. Rye	Southside	Tennessee	36 31
C. W. Butler	Anna	Illinois	37 30
G. C. Bunsen	West Belleville	do	38 35
W. Ingram	Odin	do	38 39
Hon. William McAdams	Alton	do	38 55
Nat. Hist. and Ant. Society, A. W. Harris, President	Hillsborough	do	39 12
Charles W. Robertson	Carlinville	do	39 19
H. L. Kelly	Whitehall	do	39 27
P. H. Rucker	Liter	do	39 38
A. P. Greene	Sullivan	do	39 41
T. W. Parker	Griggsville	do	39 43
W. S. Turner	Quincy	do	39 55
G. C. Pearson	Danville	do	40 08
John A. Balmer	do	do	40 08
C. W. Carter	Aledo	do	41 09
Dr. E. O. Boardman	Osceola	do	41 10
E. E. Soule	Grand Ridge	do	41 18
Dr. P. R. Sale	Colona	do	41 28
William Jenkins	Mendota	do	41 34
H. M. Griswold	Tampico	do	41 36
Joseph Anthony, jr	Coleta	do	41 46
P. L. Ong	Hennepin	do	41 47
John Brady	Batavia	do	41 49
Frank H. Wentworth	Chicago	do	41 51
J. G. Parker	do	do	41 51
H. K. Coale	do	do	41 51
J. R. Daley	do	do	41 51
John Gall	Wright's Grove	do	41 54
H. A. Kline	Polo	do	41 58
F. F. Kleckner	Davis	do	42 05
J. E. Dickinson	Rockford	do	42 16
Gilbert Le Bar	Delavan	Wisconsin	42 37
Dr. P. R. Hoy	Racine	do	42 45
William Britten	Arthur	do	42 47
G. W. F. Smith	Milwaukee	do	43 00
Charles A. Keeler	do	do	43 00
C. J. Porter	Jefferson	do	43 01
Mrs. H. M. Lewis	Madison	do	43 02
E. H. Stiles	Lake Mills	do	43 06
Dr. W. S. Burnham	Richland Center	do	43 19
J. F. Robinson	Leeds Center	do	43 20
William Toole	North Freedom	do	43 30
R. E. Mitchell	Merritt's Landing	do	43 37
John Schrooten	New Cassel	do	43 43
H. E. Wilsie	La Crosse	do	43 45
Charles H. Stoddard	do	do	43 45
G. T. Cook	Ripon	do	43 47
W. E. Ritter	Oshkosh	do	43 59

LIST OF STATIONS AND OBSERVERS FOR 1884—continued.

Name of observer.	Station.	State.	Latitude.
			° ′
C. F. Carr	Waupaca	Wisconsin	44 22
S. W. Willard	West De Pere	do	44 26
Prof. F. H. King	River Falls	do	44 45
I. N. Ward	Green Bay	do	44 30
John Byrum	do	do	44 30
Rev. F. N. White	Hancock	Michigan	47 10
C. A. Bibbins	Baldwin	Louisiana	29 30
W. W. Edwards	Abbeville	do	29 57
C. A. Bibbins	Mermenton	do	....
W. A. Monroe	Newport	Arkansas	35 36
Prof. F. L. Harvey	Fayetteville	do	36 02
Prof. H. Nehrling	Pierce City	Missouri	36 56
N. P. Ball	Reeds	do	37 08
O. Widmann	Saint Louis	do	38 40
F. A. Sampson	Sedalia	do	38 43
Mrs. M. Musick	Mount Carmel	do	38 45
G. E. Stillwell	Kansas City	do	39 06
Prof. J. W. Kilpatrick	Fayette	do	39 09
M. P. Lientz	do	do	39 09
Prof. T. B. Smith	Glasgow	do	39 14
William E. Praeger	Keokuk	Iowa	40 20
Dr. F. Kuithan	Burlington	do	40 50
Prof. C. J. Reed	do	do	40 50
E. L. Ambler	Mount Pleasant	do	41 00
W. A. Lester	Morning Sun	do	41 05
F. Eveland	Ferry	do	41 14
G. K. Cherrie	Knoxville	do	41 19
I. N. Arnold	Richmond	do	41 26
U. S. Grant	Des Moines	do	41 36
C. R. Keyes	do	do	41 36
H. N. Berry	Iowa City	do	41 38
E. F. Vincent	do	do	41 38
J. W. Preston	do	do	41 38
Mrs. V. S. Williams	Coralville	do	41 40
J. W. Preston	Newton	do	41 42
Lynds Jones	Grinnell	do	41 44
Prof. H. Osborn	Ames	do	42 00
Tenny Smith	Grand Junction	do	42 01
Charles F. Henning	Boone	do	42 03
G. D. Peck	La Porte City	do	42 18
Hon. Charles Aldrich	Webster City	do	42 27
E. T. Keim	Dubuque	do	42 30
H. L. Bond	Storm Lake	do	42 37
F. George	Williamstown	do	42 55
Miss J. A. McCleery	Douglas	do	43 00
E. M. Hancock	Waukon	do	43 15
J. W. Lindley	Mitchell	do	43 19
B. E. St. John	Fairmont	Minnesota	43 38
Dr. J. C. Hvoslef	Lanesboro	do	43 43
Thomas Miller	Heron Lake	do	43 48
G. H. Selover	Lake City	do	44 26
Dr. J. H. Sandberg	Red Wing	do	44 32
Rev. G. B. Pratt	Hastings	do	44 45
R. Linton	Pine Bend	do	44 47
E. S. Stebbins	Minneapolis	do	45 00
U. S. Grant	do	do	45 00
H. W. Hamline	do	do	45 00
Dr. P. L. Hatch	do	do	45 00
Court W. Ranslow	Fridley	do	45 05
Vernon Bailey	Elk River	do	45 25
Miss Gertrude M. Lewis	Frazee City	do	46 33
Dr. C. P. Allen	White Earth	do	47 04
Walter Negley	Eagle Pass	Texas	28 43
Dr. Thomas W. Scott	Del Rio	do	29 20
H. P. Attwater	San Antonio	do	29 27
F. Grasst	Sisterdale	do	30 00
Rev. I. B. Henry	Mason	do	30 43
William Lloyd	San Angelo	do	31 22
Dr. Thos W. Florer	Waxahachie	do	32 23
Mrs. F. M. Houts	Decatur	do	33 11
G. H. Ragsdale	Gainesville	do	33 36
R. P. Burhaus	Denison	do	33 43
W. W. Cooke	Caddo	Indian Territory	34 11
T. J. Dove	Anadarko	do	34 55
O. W. Coggeshall	Darlington	do	35 37
W. W. Cooke	Red Rock	do	36 30
W. J. Dixon	Cimarron	Kansas	37 49
Frank Kizer	Emporia	do	38 21
James McMaster	Ellsworth	do	38 45
Dr. L. Watson	Ellis	do	38 55
Prof. F. H. Snow	Lawrence	do	39 00

LIST OF STATIONS AND OBSERVERS FOR 1884—continued.

Name of observer.	Station.	State.	Latitude.
			° ′
Prof. D. E. Lantz	Manhattan	Kansas	39 12
Dr. C. P. Blachly	do	do	39 12
M. L. Penwell	Washington	do	39 50
J. Nelson, jr	Davenport	Nebraska	40 21
F. C. Kenyon	Unadilla	do	40 47
F. W. Powell	Alda	do	40 53
W. J. Kingsbury	Linwood	do	41 22
Dr. G. S. Agersborg	Vermillion	Dakota	42 56
Percy Edmison	Sioux Falls	do	43 34
S. D. Partch	Barton	do	44 15
G. S. Bishop	Huron	do	44 21
T. P. Lindley	Saint Ansgar	do	46 00
C. B. Strable	La Moure	do	46 30
S. M. Edwards	Argusville	do	47 08
W. T. Tyler	Menoken	do	46 58
T. F. Eastgate	Larimore	do	47 52
Fred Twamley	Grand Forks	do	47 55
Percy Criddle	Two Rivers	Manitoba	49 28
Manitoba Historical and Scientific Society (Rev. George Bryce, president).	Winnipeg	do	49 30
C. W. Nash	Portage La Prairie	do	50 00
A. T. Small	Oak Point	do	50 30

During the migration season of 1885 the general character of the work remained the same. Many new observers added their names to the list, and their reports form a valuable portion of the material received during that year. A great effort was made to fill up those parts of the district which lacked observers in 1884, but with few exceptions this attempt proved unsuccessful, the reason being that there are no persons in these areas who are sufficiently acquainted with birds to report their movements.

A list of the new observers and stations for 1885 was published in the Ornithologist and Oölogist for August, 1885. It contains the names of sixty-nine new observers, and of several of the observers of 1884 who had changed their residence since the previous list was printed. Ninety of the observers of 1884 promised to send notes during the following year, making the whole number of observers in 1885 one hundred and fifty-nine.

LIST OF NEW STATIONS AND OBSERVERS FOR THE YEAR 1885.

Name of observer.	Station.	State.	Latitude.
			° ′
C. J. Lemen	Shawneetown	Illinois	37 43
George Rearden	do	do	37 43
E. J. Edwards	Hillsborough	do	39 12
John A. Balmer	Paris	do	39 34
W. S. Cobleigh	Peoria	do	40 41
Burton Brown	Tampico	do	41 36
George B. Holmes	Fernwood	do	41 42
C. Crotsenburg	Clinton	Wisconsin	42 34
A. B. Wilcox	do	do	42 34
H. L. Skavlem	Janesville	do	42 39
Z. L. Welman	Stoughton	do	42 55
W. W. Gilman	do	do	42 55
F. H. Webb	Fort Atkinson	do	42 56
W. B. Hull	Milwaukee	do	43 00
T. P. Camp	Portage	do	43 31
J. A. Shoemaker	Green Bay	do	44 30
R. R. Byram	do	do	44 30
E. L. Brown	Durand	do	44 36

LIST OF NEW STATIONS AND OBSERVERS FOR THE YEAR 1885—continued.

Name of observer.	Station.	State.	Latitude. ° ′
O. G. Libby	River Falls	Wisconsin	44 45
F. M. Style	Robert's	....do	44 58
W. S. Libby	New Richmond	....do	45 09
J. P. Peterson	Luck	....do	45 35
A. I. Sherman	Bayfield	....do	46 50
E. C. Wurzlow	Houma	Louisiana	29 34
Gustave Kohn	New Orleans	....do	30 00
S. A. Ball	Reed	Missouri	37 08
Harvey Clark	Butler	....do	38 14
M. Meigs	Keokuk	Iowa	40 20
Col. G. B. Brackett	Denmark	....do	40 43
John Inghram	Burlington	....do	40 50
J. B. Green	Des Moines	....do	41 36
H. L. Bond	Iowa City	....do	41 38
W. M. Clute	....do	....do	41 38
C. R. Keyes	....do	....do	41 38
Lynds Jones	Grinnell	....do	41 44
Prof. H. W. Parker	....do	....do	41 44
Harry E. Peck	La Porte City	....do	42 18
Morton Peck	....do	....do	42 18
Alexander Scougale	Sioux City	....do	42 28
H. S. Williams	State Centre	....do	42 59
Rev. C. E. Cline	Emmetsburg	....do	43 08
John A. Mosher	Spirit Lake	....do	43 26
Pres. R. B. Abbott	Albert Lea	Minnesota	43 58
W. D. Hurlbut	Rochester	....do	44 01
E. A. Wise	Lake City	....do	44 26
G. Graham	Red Wing	....do	44 32
H. Willard	....do	....do	44 32
L. Hancock	....do	....do	44 32
L. D. Perkins	Excelsior	....do	44 55
F. M. Dimond	Excelsior	....do	44 55
H. W. Slack	Saint Paul	....do	45 57
Prof. C. L. Herrick	Minneapolis	....do	44 00
Franklin Benner	....do	....do	45 00
Mrs. L. F. Tinsley	....do	....do	45 00
F. L. Washburn	....do	....do	45 00
H. P. Bennett	Saint Cloud	....do	45 32
W. W. Cooke	Moorhead	....do	46 56
Mrs. C. A. Cooke	White Earth	....do	47 04
Bro. M. Newell	San Antonio	Texas	29 27
Prof. G. Jermy	....do	....do	29 27
Rev. G. Birkman	Fedor	....do	30 20
N. P. Ball	Fort Worth	....do	32 44
H. F. Peters	Bonham	....do	33 34
V. L. Kellogg	Emporia	Kansas	38 21
B. L. Bennett	....do	....do	38 21
William S. Smith	Richmond	....do	38 34
J. F. Williams	Topeka	....do	39 03
N. A. Sherman	York	Nebraska	40 48
A. M. Blanchard	Grand View	Dakota	43 50
George Wilder	Huron	....do	44 21
H. H. Parkhouse	Valley City	....do	46 55
Thomas Russell	Steele	....do	47 01
Fred Twamley	Minto	....do	47 58
Will Dean	Johnstown	....do	48 04
W. C. Bennett	Fort Totten	....do	48 50
Miss Lottie Yeomans	Dalton	Manitoba	....
E. Calcutt	Shell River	....do	....
Frank Wagner	Ossowo	....do	....

[NOTE.—All of the stations enumerated in the above lists for 1884 and 1885 will be found on the accompanying map of the Mississippi Valley. The exact position of each station is indicated by a black triangle. This map is particularly valuable to the student of the migration and distribution of species because it shows at a glance the altitudes of the several areas embraced in the region of which the report treats. Altitude, it is well known, is the principal factor governing the distribution of species in places of the same latitude.—C. H. M.]

In the spring of 1885 Dr. C. Hart Merriam, chairman of the Committee on Migration of the American Ornithologists' Union, prepared and sent out blank schedules for the use of the observers in reporting their notes. A copy (on a reduced scale) of the heading of one of these schedules is here given:

INLAND DIVISION.

1885.

AMERICAN ORNITHOLOGISTS' UNION.

COMMITTEE ON BIRD MIGRATION.

BIRDS OBSERVED AT STATION.

Number of station, ——. Name of station, —— ——.
Name and P. O. address of observer, —— ——, —— ——.

Name of bird.	When was it first seen, and about how many were observed?	When was it next seen?	When did it become common?	When was it last seen?	Is it common or rare?	Does it breed near your station?	Remarks.

On the back of the schedules the following "Instructions" were printed:

INSTRUCTIONS.

In the first column should be stated the exact date when each kind of bird was first seen. This entry should be made on the day the bird arrives—not from memory afterwards (general statements, such as "late in March," "early in April," etc., are of no value). The number observed (approximate) should also be recorded.

In the second column should be stated the date when the same kind of bird was next seen—whether this happens on the very next day, the next week, or not till a month later.

In the third column should be stated the date when the bird becomes common. Some birds come in a body and are common from the day of their first arrival, while others straggle along and are not common for a month or more; and others still are never common.

In the fourth column should be stated the last date when the bird was observed. In the spring migration this column will remain vacant in those species which breed in the neighborhood, as it can be filled only when all the individuals go north. In the fall migration it should be filled in those species which pass farther south, but must remain vacant in those which spend the winter in the vicinity of the station.

In the fifth column should be stated whether the species is abundant, common, tolerably common, or rare.

In the sixth column it is necessary only to say yes or no.

Each schedule contained spaces for noting the movements of 36 species of birds.

In 1885, schedules relating to spring migration were received from 87 observers, distributed as follows: One in Mississippi, 12 in Illinois, 16 in Wisconsin, 1 in Louisiana, 6 in Missouri, 19 in Iowa, 11 in Minnesota, 5 in Texas, 4 in Kansas, 2 in Nebraska, 6 in Dakota, and 4 in Manitoba. These observers sent reports as follows: Twelve occupied less than half a schedule, 21 occupied more than half but less than a whole schedule, 28 sent one full schedule, 10 sent one and a half schedules, 5 sent two schedules, 4 sent two and a half schedules, and 7 sent three or more schedules.

In addition to the schedules several hundred notes were sent in letters. Schedules relating to fall migration were received from 16 observers, distributed as follows: One in Illinois, 1 in Wisconsin, 2 in Missouri, 3 in Iowa, 3 in Minnesota, 2 in Texas, 2 in Kansas, 1 in Dakota, and 1 in Manitoba.

These observers sent reports as follows: Three occupied less than half a schedule, 1 occupied more than half but less than a whole schedule, 9 sent one full schedule, 2 sent two schedules, and 1, Mr. Otto Widmann, sent the most complete record of fall migration that has ever been made in the United States.

NOTES ON THE MIGRATION AND DISTRIBUTION OF EACH SPECIES REPORTED AS INHABITING THE MISSISSIPPI VALLEY.

In the first circular on migration issued by the American Ornithologists' Union, records were called for concerning four movements for each species of bird, namely, the arrival of the first, the arrival of the bulk, the departure of the bulk, and the last one seen. The notes contributed by observers relate principally to first arrivals. Of a few species a number of 'lasts' were noted, and of still fewer the movements of the bulk are recorded with sufficient fullness to serve as the basis of intelligent study.

The second circular issued by the American Ornithologists' Union contained instructions for the year 1885. It called for records of the arrival of the first individual of a species, for the date when it was next seen, when it became common, and when the last one was seen. The records received under the second and third of these headings are very disappointing. These records are voluminous, numbering several thousand, but they are almost without value. The records of the second time the species was seen have served in a few instances as a check on the date of the first arrival, showing whether the first seen was a straggler or a regular arrival, but these instances are very much fewer than had been expected. When the dates of arrival and departure of bulk were asked for, not many observers gave these records, but the notes that were sent were usually of value, since in most instances they indicated a real movement of the species at the date specified.

In my experience the record "common" can not be so interpreted; indeed, it cannot be interpreted in any manner which will throw any light on the movements of the species.

The records for 1885 give no intimation of the arrival or departure of the bulk of the species, but merely furnish notes on the first and the last, with two additional checks on the record of the first seen. What has just been said does not apply to Mr. Otto Widmann's notes for 1885, since, as in former years, he kept a full record of all the movements of each species.

In preparing this part of the report the chief endeavor has been to trace the movements of the van of each species, while the more important part, relating to the movements of the bulk, must be left unnoticed.

The departure of a bird from any point is necessarily followed by its arrival at some other point; so that when a departure is noted a corresponding arrival may be looked for. The record of a typical movement of a species in its northern migration would contain: 1st, the record of the earliest arrival; 2d, the arrival of the bulk of the species at a point somewhat farther south; 3d, the departure of the bulk from a point still farther south; 4th, the departure of the last individual from the southern limit occupied by the species on the same day.

Such a contemporaneous record would prove that during the previous night a general movement of the species had taken place.

Were all the records as full as those of the first arrivals many such typical movements undoubtedly would be found. This, however, would be too much to expect. What we ought to find recorded is an arrival of the bulk of a species for each corresponding departure, and when the stations become sufficiently numerous, and the observers more thoroughly trained, these important items will be forthcoming in many if not in most cases. Then and not till then will something definite be known concerning the distance actually traveled by birds during a single night's migration. The computations based on first arrivals will always be very uncertain, and if accurate information ever is obtained it must come almost entirely from the movements of the bulk. *

In the systematic portion of this report it has been found impracticable to give in full all the notes contributed by the different observers, be-

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[* Again I am forced to differ with Professor Cooke. There is no evidence to show that in any species of bird a sufficiently large proportion of the total number of individuals comprising the migratory host move forward together at one time to justify the description of such a movement as that of "the bulk of the species." On the contrary, migration consists of a series of successive movements or waves, each of which brings a variable number of individuals to places a variable distance in advance of the point or points from which they started. It was the recognition of these facts that led me to omit reference to "bulk" movements in preparing the circular for 1885, and to insert the following statement, of which Professor Cooke makes no mention:

"The committee particularly desires exact records of every increase and decrease in the numbers of a given species over a given area; for it is only by the knowledge of the daily fluctuations of the same species in the same place that the progress and movements of a 'flight,' or 'bird wave,' can be traced. Such data can be contributed by experienced observers only, and in their procurement much time must be spent in the field. During the progress of the migratory movement the observer should go over the same ground day after day, and, if possible, both early in the morning and late in the afternoon. He should visit woodlands, thickets of dense undergrowth, and open fields; and, if possible, both swamp and upland should fall under his daily scrutiny."—C. H. M.]

cause of their voluminousness; nor is it necessary to do so in the present connection. The prime object to be attained is a complete knowledge of the movements of each species. Such knowledge can be gained only by the accumulation of the facts noted by many observers over a term of years. The facts so accumulated will serve as a guide to the time of the appearance and disappearance of each species, and also will serve as a check to the observers' records. By this means the observers will be enabled to correct many mistakes into which they will fall, and will be guided to record many interesting facts which otherwise would escape notice.

The above points have been dwelt upon in order that no observer may feel slighted should he not find credit given for all his observations. For example, some 60 or 70 stations scattered over every State in the district report the White-bellied Nuthatch as a resident. It is enough for present purposes to say that the species is resident throughout the Mississippi Valley. Or if, in the records of migration, 5 or 6 stations situated on the same parallel record the arrival of a species about the same time, it is more intelligible to say that on that date the van reached this latitude, than to give the name, latitude, and date for each of the stations.*

The rule here followed is that the shorter the record the more easily it is comprehended, and the supposition is that the student of this report will always have a map before him. It is useless to attempt to study migration without this aid.

The remaining or systematic portion of the report aims to be entirely historical rather than philosophical or theoretical; and it must be remembered that it is based upon notes, many of which, through lack of sufficient ornithological knowledge on the part of the observer, undoubtedly are erroneous, but which, since they bear on their face the appearance of truth, have been accepted as facts. Hence, while great care has been taken to make the statements as accurate as possible, errors undoubtedly have crept in, and the author will consider it a special favor if those who discover such will communicate the fact to him.

There remains the pleasant duty of acknowledging the assistance received from various sources. The first acknowledgments are due to the observers, without whose able and united efforts nothing could have been accomplished. These persons have given their time and thought to the work without compensation, stimulated only by their love of nature and their interest in scientific work; and many have expressed the pleasure it afforded them by the statement "the enjoyment we have derived from the work has more than repaid us." To Dr. C. Hart Merriam the thanks of all are due for his untiring zeal in bringing the work before the public and enlisting the services of observers, and for the

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[*I cannot agree with Professor Cooke in this method of treating records of migration. Owing to the difference in altitude of stations on the same parallel, and to the influence of topography and other local conditions, I deem it necessary to give in full the exact records of each observer.—C. H. M.]

laborious task of editing the manuscript of this report and seeing it through the press. Mr. Ridgway, both as representing the Smithsonian Institution, and personally, has aided in settling disputed points of identification and distribution; and Mr. Allen and Dr. Coues have assisted in the same manner. Nor should the able efforts of Prof. D. E. Lantz, of Manhattan, Kans., be forgotten. Not only did he furnish, for two years, a very full and acceptable set of notes on migration, but when the sickness of the author threatened to prevent the completion of this report, Professor Lantz came to his assistance, and, although already burdened by his own private work, found time to write nearly one-eighth of the systematic portion of this report. Last, but not least, should the author endeavor to acknowledge his indebtedness to Mr. Otto Widmann, of Saint Louis, Mo. When the work was begun and its future seemed clouded in doubt, his voluminous and valuable notes turned the scale; later, when delays and discouragements came, his advice and encouragement awoke renewed vigor and interest. Not only does the material contributed by Mr. Widmann form the most valuable part of the present report, but during its preparation his aid has been so constant that it is perhaps not too much to say that his name should be included as joint author.

Thanks are due, also, to the U. S. Signal Service for kindly furnishing weather reports and maps.

SECOND PART.

SYSTEMATIC REPORT.

1. **Æchmophorus occidentalis** (Lawr.). [729.] *Western Grebe.*

An inhabitant of western North America, coming eastward to Manitoba. Twenty years ago Donald Gunn discovered this Grebe breeding abundantly at Shoal lake and Lake Manitowaba, Manitoba (Smithsonian Report for 1867, pp. 429–430). More recently Prof. John Macoun, botanist to the Geological and Natural History Survey of Canada, found it breeding "in thousands" on Waterhen river; and still more recently Mr. Ernest E. T. Seton (now E. E. Thompson) has recorded specimens from Long lake, Manitoba (The Auk, Vol. II, 1885, p. 314).

2. **Colymbus holbœllii** (Reinh.). [731.] *Holbœll's Grebe; American Red-necked Grebe.*

A northern species, coming south in winter irregularly to the northern half of the Mississippi Valley; has been taken as a rare visitant at Alda, Nebr. Said to breed in northern Manitoba.

3. **Colymbus auritus** Linn. [732.] *Horned Grebe.*

Winters over most of the Mississippi Valley and breeds from northern Illinois northward; reported by various observers in Missouri, Nebraska, and Wisconsin. In 1885 it arrived at Lake City, Minn., April 23.

4. **Colymbus nigricollis californicus** (Heerm.). [733a.] *American Eared Grebe.*

Occurs throughout the western row of States in the district; breeds from Texas northward, and winters from Texas southward; was noted by observers at Saint Louis, Mo., Manhattan, Kans., Ellis, Kans., and Vermillion, Dak. In the spring of 1885 it was first reported from Emporia, Kans., April 14, and again April 30. At Saint Louis, Mo., the first, a male, came April 24. In the fall of 1885 it was seen at Emporia September 8 and at Saint Louis September 22. It remained at Saint Louis until October 7.

5. **Colymbus dominicus** Linn. [734.] *St. Domingo Grebe.*

This is a tropical species, coming north to the valley of the lower Rio Grande in Texas. Near Fort Brown it is a "rather common resident" (Merrill, Proc. U. S. N. Mus., 1878, p. 172). It occurs at least as far up the river as Lomita ranch, above Hidalgo (Sennett, Bull. U. S. Geol. and Geog. Sur. Ter., Vol. V, No. 3, 1879, p. 440).

6. Podilymbus podiceps (Linn). [735.] *Pied-billed Grebe; Hell Diver; Dabchick.*

Winters wherever there is open water, from Illinois southward. and breeds from southern Indiana, Illinois, Missouri, and eastern Kansas northward. The records for 1884 are so irregular that it can only be said that during the last of April and first of May the Dabchick was migrating on both sides of the forty-third parallel, and appeared May 6 at Portage la Prairie, Manitoba. In the fall of 1884 it was first seen at Emporia, Kans., September 20 and was common the same day.

The records for 1885 are scarcely more regular than those for 1884. Its arrival was noted at Laporte City, Iowa, April 1; Lanesboro, Minn., April 3; Saint Louis, Mo., April 6; Paris, Ill., April 19; Heron Lake, Minn., April 9, and Shell River, Manitoba, May 3. In the fall of 1885 the first came to Emporia, Kans., September 16, and to Shawneetown, Ill., October 3. The last left Lanesboro, Minn., November 9, and Saint Louis, Mo., October 27. Mr. Lloyd states that it is tolerably common in winter in Tom Green and Concho counties, Texas (The Auk, Vol. IV, 1887, p. 184).

7. Urinator imber (Gunn.). [736.] *Loon.*

Breeds from northern Illinois and Minnesota northward. Occurs in winter at suitable localities over most of the Mississippi Valley, even as far south as San Angelo, Tex. (Lloyd), Corpus Christi bay (Sennett), and Waverly, Miss. (Young). During the first eleven days of April in 1884 it was recorded at various places from latitude 39° to latitude 45° 25′, and May 1 it reached Oak Point, Manitoba.

In the spring of 1885 two sets of notes were contributed. The first was as follows: Laporte City, Iowa (lat. 42° 18′), March 31; New Cassel Wis. (lat. 43° 40′), April 4; Excelsior, Minn. (lat. 44° 55′), April 5; Emmetsburg, Iowa (lat. 43° 8′), and Saint Louis, Mo. (lat. 38° 40′), April 6; Heron Lake, Minn. (lat. 43° 48′), April 8; Lanesboro, Minn. (lat. 43° 43′), April 9. The second set was: Luck, Wis. (lat. 45° 35′), April 20; Des Moines, Iowa (lat. 41° 36′), Ferry, Iowa (lat. 41° 14′), and Lake Mills, Wis. (lat. 43° 6′), April 21, and Shell River, Manitoba, May 4. The last left Saint Louis, Mo., April 11, and Ferry, Iowa, April 29. In the fall of 1885 the last left Heron Lake, Minn., November 7.

9. Urinator arcticus (Linn.). [738.] *Black-throated Diver.*

Breeds in the far north, coming south in winter, rarely to the Great Lakes.

11. Urinator lumme (Gunn.). [740.] *Red-throated Diver.*

A northern species; breeding about the larger lakes in Manitoba, and thence northward; dispersed in winter irregularly over the northern half of the Mississippi Valley.

21. Synthliboramphus antiquus (Gmel.). [753, 759.] *Ancient Murrelet; Black-throated Guillemot.*

Inhabits the islands and shores of the North Pacific; accidental once on Lake Koshkonong, Wis. (Sennett, Auk, Vol. I, 1884, p. 98).

36. Stercorarius pomarinus (Temm.). [697.] *Pomarine Jaeger.*

Breeds in the far north, coming south to the Great Lakes in winter. "Winter visitant to Lake Michigan" (Ridgway); "twice seen in Nebraska" (Aughey).

37. Stercorarius parasiticus (Linn.). [698.] *Parasitic Jaeger.*

Breeds in the far north, coming south in winter to the Great Lakes, and even to Illinois (Ridgway).

38. Stercorarius longicaudus Vieill. [699.] *Long-tailed Jaeger.*

Breeds in the Arctic regions, coming south in winter to the northern States; "casual winter visitant in Illinois" (Ridgway).

40. Rissa tridactyla (Linn.). [658.] *Kittiwake.*

A northern species, coming south in winter to the Great Lakes. It has been noted from Minnesota (Hatch), and Illinois (Nelson); and March 17, 1884, one was seen by Dr. P. R. Hoy at Racine, Wis.

42. Larus glaucus Brünn. [660.] *Glaucous Gull.*

Another northern species, appearing as a winter visitant at Lake Michigan, and once taken as far south as Clay county, Tex. (Ragsdale, Bull. N. O. C., Vol. VI, 1881, p. 187). Dr. P. R. Hoy took a fine specimen at Racine, Wis., March 17, 1884.

43. Larus leucopterus Faber. [661.] *Iceland Gull.*

Breeds in the far north, coming south in winter to the Great Lakes; occurs regularly on Lake Michigan (E. W. Nelson).

47. Larus marinus Linn. [663.] *Great Black-backed Gull.*

Breeds from the Gulf of St. Lawrence northward, coming south in winter to the Great Lakes (Lake Michigan, Nelson).

51a. Larus argentatus smithsonianus Coues. [666a.] *Herring Gull.*

Breeds from southern Minnesota northward, and migrates over nearly the whole of the Mississippi Valley. This species was seen at Chicago in the winter of 1883–'84, and usually a few winter on Lake Michigan. As a rule it is found in winter throughout Illinois and thence southward to the Gulf of Mexico. The severe cold of January, 1884, drove it almost entirely out of Illinois. One was seen at Saint Louis after the river began to be full of floating ice. It returned to Saint Louis January 29; two days later a party of eighteen went north, and February 3 between seventy-five and eighty-five went north above the Mississippi. At Heron Lake, Minn., the first came March 24. They breed from Heron Lake northward. There is a record of a large Gull, probably this species, from Oak Point, Manitoba, April 21.

At Chicago, Ill., Herring Gulls were common throughout the winter of 1884–'85, and as the Mississippi river did not freeze over they remained all winter at Saint Louis, Mo. Their migration at that place in the spring of 1885 began February 27, and the next day they were seen going north in regular migration wedge, taking their annual overland route just in the rear of the city, cutting short the great bend which the Mississippi river makes north of Saint Louis. Many old birds in beautiful plumage were seen all day soaring in majestic gyrations at enormous heights above the Mississippi. At Saint Louis the last was seen April 12; at Lake City, Minn., the first April 26, and the last May 10. In the fall of 1885 the first was seen at Milwaukee, Wis., August 8, and the last November 21.

53. **Larus californicus** Lawr. [668.] *California Gull.*

A rare visitant from the west. Colonel N. S. Goss shot one on the Arkansas river, in Reno county, Kans., October 20, 1880.

54. **Larus delawarensis** Ord. [669.] *Ring-billed Gull.*

Breeds from the northern tier of States northward; occurs in winter as far north as southern Illinois, and occasionally Saint Louis, and is a common winter resident along the coast of Texas and Louisiana. It was shot in Chicago harbor in the latter part of December, 1883. In 1884 the first migrant was seen at Saint Louis February 26, and the bulk came to Vermillion, Dak., March 31. The other dates are more or less irregular.

In the spring of 1885 the only arrivals noted were as follows: Emporia, Kans., April 30; Luck, Wis., April 17, and Heron Lake, Minn., April 9.

In the fall of 1885 it left Heron Lake November 11. According to Ridgway it is a summer resident in the northern part of Illinois, but is not yet known certainly to breed there.

58. **Larus atricilla** Linn. [673.] *Laughing Gull.*

Belongs more particularly to the South Atlantic and Gulf States; breeds plentifully on the coasts of Texas and Louisiana, and a few pass up the Mississippi during the summer as far as southern Illinois. It is not known from Kansas, but was recorded by Mr. Powell at Alda, Nebr., in July 1880.

59. **Larus franklinii** Sw. & Rich. [674.] *Franklin's Gull.*

Franklin's Gull breeds from southern Minnesota and Dakota northward; winters in the Southern States, and migrates principally west of the Mississippi river. The records of its movements are irregular and unsatisfactory. In 1884 it arrived at Portage la Prairie, Manitoba, April 21. In 1885 it was reported from Emporia, Kans., April 10. It breeds abundantly in Dakota and western Minnesota, and thence northward. Until within a few years its presence anywhere in the United States in summer was considered a rare occurrence. In 1879 Roberts and Benner found it common in the Traverse Lake region in western Minnesota in June (Bull. Nutt. Ornith. Club, Vol. V, 1880, p. 20). In 1884 Mr. Thomas Miller reported it as an abundant summer resident at Heron Lake, in southwestern Minnesota; and Mr. J. W. Preston has recently found it breeding in numbers in western Minnesota, where it is said to have arrived April 9, and left September 29, 1885 (Ornithologist and Oölogist, Vol. XI, No. 4, April, 1886, pp. 54-55). October 22, 1884, Mr. S. W. Willard took a female near the mouth of Fox river, in eastern Wisconsin.

60. **Larus philadelphia** (Ord.) [675.] *Bonaparte's Gull.*

Breeds from Manitoba northward (and probably in northern Minnesota as well); winters along the Gulf of Mexico and southward, and sometimes in Illinois. In the spring of 1884 it was noted from Lanesborough, Minn., April 23, and from River Falls, Wis., April 28. In 1885 it arrived at Hennepin, Ill., April 17.

62. **Xema sabinii** (Sab.). [677.] *Sabine's Gull.*

Breeds in the Arctic regions, coming south in winter rarely and irregularly to the United States. It is a rare winter visitant at Lake Michigan (Nelson), and was taken once in Kansas in the fall (at Humboldt, September 21, 1876, by Col. N. S. Goss).

63. **Gelochelidon nilotica** (Hasselq.). [679.] *Gull-billed Tern; Marsh Tern.*

Breeds commonly in suitable places along the coast of Texas; rare inland, but has been reported irregularly from other parts of the Mississippi Valley.

64. **Sterna tschegrava** Lepech. [680.] *Caspian Tern.*

An irregularly distributed species, common in the Gulf of Mexico, where it breeds at various places along the coasts of Texas and Louisiana. Mr. Hatch gives it in his list of Minnesota birds, and Mr. Preston has taken it in central Iowa. There is also a record of three that were shot at Cincinnati October 9, 1882.

65. **Sterna maxima** Bodd. [681.] *Royal Tern.*

A southern species, breeding commonly along the coasts of Texas and Louisiana. A summer visitant in Illinois.

67. **Sterna sandvicensis acuflavida** (Cabot). [683.] *Cabot's Tern.*

An inhabitant of the South Atlantic and Gulf coasts, breeding commonly along the coast of Texas.

69. **Sterna forsteri** Nutt. [685.] *Forster's Tern.*

The most common Tern of the Mississippi Valley, wintering in the South, and breeding from Texas to Dakota, Minnesota, Wisconsin, and Manitoba. In 1884 it was noted from Manhattan, Kans., May 1; and a Tern, probably of this species, was seen at Oak Point, Manitoba, May 17.

In 1885 it was seen at Emporia, Kans., April 18; and at Heron Lake, Minn., April 21. In the fall of 1885 two birds, young of the year, were seen at Lanesboro, Minn., August 21, and the species was last seen at Heron Lake, October 14.

70. **Sterna hirundo** Linn. [686.] *Common Tern.*

Breeds commonly on the larger lakes in Manitoba, and has been noted at various places in the Mississippi Valley. It was recorded as a migrant at West De Pere, Wis., and as having been taken by Mr. Preston in central Iowa.

74. **Sterna antillarum** (Less.). [690.] *Least Tern.*

Chiefly coastwise, but passes up the Mississippi Valley to Dakota and Minnesota. Breeds abundantly along the Gulf coast in Louisiana and Texas; also in the interior; known to breed in Kansas and Dakota.

In the fall of 1885 it appeared at Emporia, Kans., August 12; was last seen at Saint Louis, Mo., August 31, and returned to Bonham, Tex., August 20.

75. **Sterna fuliginosa** Gmel. [691.] *Sooty Tern.*

A tropical and subtropical maritime species of wide distribution; common along the Gulf coast.

77. **Hydrochelidon nigra surinamensis** (Gmel.). [693.] *Black Tern.*

Winters beyond our border, and breeds from southern Illinois and Kansas, northward. In 1884 it was noticed at Saint Louis April 29, and at Heron Lake, Minn., May 1. May 17 it came to Oak Point, Manitoba; May 15 it was passing over Laporte City, Iowa, in large flocks. In the fall of 1884 the first flock appeared at Emporia, Kans., August 19.

In the spring of 1885 they were seen at Emporia, Kans., and Heron Lake, Minn., the last day of March and the first day of April. They arrived at Luck, Wis., April 17; at Huron, Dak., May 14, and May 18 eleven were seen at Shell River, Manitoba, latitude 50°. They were seen during the whole summer at Emporia, Kans., the extreme western limit of their breeding range. In the fall of 1885 they were reported at Richmond, Kans., July 25; again August 4, and common August 12. The last left Heron Lake, Minn., November 11; a few were seen at Saint Louis, Mo., October 7, and the last left there October 21. The first came to Bonham, Tex., August 22. Mr. Lloyd says it is tolerably common in western Texas in fall migration.

78. **Hydrochelidon leucoptera** (Temm.). [694.] *White-winged Black Tern.*

A European species; accidental once at Lake Koshkonong, Wis. (Kumlien, specimen now in U. S. National Museum).

79. **Anous stolidus** (Linn.). [695.] *Noddy.*

A tropical and subtropical maritime species; reported as breeding abundantly along the coast of Texas.

80. **Rynchops nigra** Linn. [656.] *Black Skimmer.*

A maritime species, breeding abundantly on the islands along the Gulf coast in Louisiana and Texas.

115. **Sula sula** (Linn.). [652.] *Booby.*

A tropical maritime species coming north to the Gulf States; reported as not common along the coast of Texas.

117. Sula bassana (Linn.). [650.] *Gannet.*

A maritime species, breeding in the North Atlantic and Gulf of St. Lawrence, and coming south in winter when it sometimes occurs along the coasts of the Gulf States.

118. Anhinga anhinga (Linn.). [649.] *Anhinga; Snake Bird.*

Resident in the Southern States, where it is commonly called the "Water Turkey." In summer it passes north regularly to southern Illinois; and it has been taken once in western Kansas (in August, 1881). It was noted by the observers from Mississippi to San Angelo, Tex. On the south Concho, near the latter place, it is a tolerably common fall migrant (Lloyd). In eastern Texas it breeds abundantly (Nehrling).

In the fall of 1884 the first migrant appeared at San Angelo, Tex., September 19. It was again seen September 21 and September 30. One was shot and mounted by Mr. Munroe at Newport, Ark. (lat. 35° 36′), during the winter of 1884–'85.

120. Phalacrocorax dilophus (Sw. and Rich.). [643.] *Double-crested Cormorant.*

Winters in the Southern States, rarely north to Illinois; breeds from Minnesota and Dakota northward. In migration it is common throughout the Mississippi Valley. In 1884 it arrived at Saint Louis March 27; at Laporte City, Iowa, March 31, and at Lanesboro, Minn., probably April 4; the bulk arriving just a month later, May 4. The full record from Saint Louis is as follows: March 27, first (three) pass north; April 3 to 5, flocks passing north; April 15, height of the season; May 11, bulk of young go north; May 22, last seen.

In the spring of 1885 the first north-bound troop came to Saint Louis, Mo., March 31, and the same day a single bird was seen at Emmetsburg, Iowa. They reached Laporte City, Iowa, April 2; Heron Lake, Minn., April 11; Lanesboro, Minn., April 21; and Shell River, Manitoba, May 13. The last flock was seen at Saint Louis, Mo., April 20. This Cormorant used to breed abundantly in a few places in northern Iowa, where Mr. Preston, of Newton, Iowa, says he has taken a great many sets of eggs. In the fall of 1885 the first came to Lanesboro, Minn., September 29, and the last left Heron Lake, Minn., November 16. It was first seen at Saint Louis, Mo., October 5.

120a. Phalacrocorax dilophus floridanus (Aud.). [643*a*.] *Florida Cormorant.*

Resident along the Gulf coast; in summer, north to Illinois; sometimes winters in southern Illinois. Has been taken at Saint Louis, Mo. One was shot in western Texas in the fall of 1880.

121. Phalacrocorax mexicanus (Brandt). [644.] *Mexican Cormorant.*

A common resident along the coast of Texas; occurs in the Mississippi Valley as far north as southern Illinois and Kansas. One was killed near Lawrence, Kans., April 2, 1872, and another in Mitchell county, Kans., in the spring of 1881.

125. Pelecanus erythrorhynchos Gmel. [640.] *American White Pelican.*

Winters abundantly in the Gulf States, and breeds from southern Minnesota northward. The records for 1884 show plainly that they are not those of the real 'firsts,' but the dates when the species happened to be seen, and nothing further can be obtained from them than the general statement that during the month of April this species was migrating in Missouri, Illinois, Iowa, Nebraska, Dakota, and Minnesota. At Vermillion, Dak., at least five hundred were seen in a single flock April 21.

In the spring of 1885 flocks of Pelicans, probably this species, were seen at Gainesville, Tex., March 7 and April 6. They were reported from Cimarron, Kans., March 9; Mount Pleasant, Iowa, March 18; Grinnell, Iowa, March 30; and Huron, Dak., April 3. The last were seen at Linwood, Nebr., April 16; Ferry, Iowa, April 29; Manhattan, Kans., May 1; and at Heron Lake, Minn., 30 were seen May 10, and 50 May 12.

In the fall of 1885 the first, a flock of 11, came to Grinnell, Iowa, September 13, and the first was seen at Emporia, Kans., October 13; at Saint Louis, Mo., the first was seen September 14; a large body passed over October 6, and the last was seen October 7.

126. Pelecanus fuscus Linn. [641.] *Brown Pelican.*

A southern species; accidental once in Illinois, where it was seen by Mr. C. K. Worthen. It is a common resident along the Gulf coast, and breeds abundantly in eastern and southeastern Texas. Mr. C. W. Beckham states that it is said to breed in the lakes above Bayou Sara, Louisiana. (Bull. N. O. C., Vol. VII, 1882, p. 165.)

128. Fregata aquila (Linn.). [639.] *Man-o'-War Bird.*

Resident along the Gulf coast. The Man-o'-War Bird is strictly a maritime species, hence its occurrence at a distance of 800 miles from the nearest salt water is a matter of special interest. One was killed with a stone while sitting on a tree in Osborne county, Kans., August 16, 1880. It was mounted by Mr. Frank Lewis, of Downs, Kans. He has lost track of the specimen, but a photograph of it, taken after mounting, is now in my possession and identifies it beyond a doubt. A still more remarkable case occurred during the same month (August, 1880) in Wisconsin. A Man-o'-War Bird was killed while flying in the vicinity of Humboldt, a small village on the Milwaukee river a few miles north of Milwaukee, Wis. The bird was preserved and is now in the Milwaukee Public Museum.

129. Merganser americanus (Cass.). [636.] *American Merganser.*

A common species, wintering from Kansas and Illinois southward, and breeding from Minnesota northward. In 1884 the bulk reached Burlington, Iowa, March 5; Newton, Iowa, March 17, and the first came to Heron Lake, Minn., March 24.

In the spring of 1885 it was seen at Shawneetown, Ill., February 27, and was not again seen until it had reached Heron Lake, Minn., March 26. It was afterwards noted at Des Moines, Iowa, April 4; Lanesboro, Minn., April 4; and Green Bay, Wis., April 7. It has been found breeding in northern Iowa by Mr. Preston, of Newton, Iowa. In the fall of 1885 a large flock was seen at Saint Louis November 12.

130. Merganser serrator (Linn.). [637.] *Red-breasted Merganser.*

A winter resident in southern Wisconsin, along Lake Michigan, throughout the State of Illinois, and southward. Breeds from northern Illinois and Minnesota northward. In 1884 it was only noticed in migration at Heron Lake, Minn., where it arrived April 2.

In the spring of 1885 a flock of about 200 was seen at Emporia, Kans., March 7, and at Laporte City, Iowa, March 25. April 1 there was a queried note from Lanesboro, Minn., and April 4 they reached Heron Lake, Minn. They were taken also during spring migration at Tampico, Ill.

131. Lophodytes cucullatus (Linn.). [638.] *Hooded Merganser.*

In Illinois the Hooded Merganser is resident throughout the State and breeds everywhere. In Kansas it is a common winter resident and breeds very rarely. A few breed in Florida. In western Texas it is common in winter. It is common and breeds in Wisconsin, Minnesota, Dakota, and Manitoba.

In the spring of 1884 it reached Burlington, Iowa, March 15; Laporte City, Iowa, March 17; Heron Lake, Minn., March 24; Green Bay, Wis., March 28; and Red Wing, Minn., April 4. It was known once to remain throughout the winter at Lanesboro, Minn., in an open part of the Root river.

In the fall of 1884 the first migrant appeared at Des Moines, Iowa, October 24, and the last was seen November 17. It was given as a very rare bird at San Angelo, Tex., where one was shot in 1884.

In the spring of 1885 it was seen at Shawneetown, Ill., February 27; Heron Lake, Minn., April 4; Des Moines, Iowa, April 9; Emporia, Kans., April 14; Hastings, Minn., April 13; Menoken, Dak., May 1. A nest with twelve fresh eggs was found at Peoria, Ill., April 20. At Waverly, Miss., it is said to nest in March. In the fall of 1885 it was last seen at Heron Lake, Minn., November 30.

132. Anas boschas Linn. [601.] *Mallard.*

The Mallard occurs in suitable places over the whole of the northern hemisphere. It is the best known of the Mississippi Valley Ducks, and for this reason is here taken as their type. It is one of the most hardy species, and is pretty sure to be found among the first that arrive in spring. When notes have been sent in merely saying that "Ducks" have been seen, they have been brought under this head, so that the present discussion is not so much that of the Mallard in particular as of Ducks in general. The Mallard breeds from Indiana and Iowa northward, and a few breed as far south as Kansas. In winter they are usually resident in southern Illinois and southern Kansas, but the extreme cold of the 1st of January, 1884, froze all ponds, lakes, and rivers, compelling them to move further south. In southern Missouri, consequently, they were unusually abundant during the winter of 1883–1884, and at Caddo, Ind. Ter., a few stayed through the winter, but the great majority moved much further south. Like the Robin and other hardy species, they remain far north when the conditions are favorable. Given food and open water no degree of cold seems to affect them. Some habitually remain on the Illinois river in northern Illinois; seven were seen January 11, at Vermillion, Dak., where they were never before seen in winter; and several spent the winter, enduring a temperature of more than 35° below zero, at Lake Pepin, Minn., and in a small open creek near the same place; while they have been often known to winter around the warm springs in Wyoming. At Moss Point, Miss., only a few miles from the Gulf, the first Mallards arrived November 15, 1883, and the bulk from December 1 to December 15. They were present by thousands during their short "winter," and the bulk left the coast about the middle of January. All were gone February 1, at which date the bulk had hardly passed north of the Gulf States, so that during the latter part of January and the first half of February the great mass of the Mallards was gathered between parallels 33° and 37°. In southern Louisiana the movements of Ducks in general began somewhat later, but they were fairly under way by February. Probably few Mallards were included in this flight, which was principally composed of the coast Ducks rather than the river Ducks. Before this, in the latter part of January, and the first few days of February, the warm wave had caused great movements among the river Ducks. They returned to southern Illinois, and to those parts of southern Missouri up to Saint Louis, from which they had been driven early in January. The limit of this movement was at Odin, Ill. (lat. 38° 39′), and, on the Mississippi river, at Alton, Ill. (lat. 38° 55′). In the West the wave was scarcely felt north of Caddo, Ind. Ter., and not at all in the northern part of the Territory, where the moisture which fell in copious rains in the southern portion was precipitated as snow and sleet. Then followed a month of constant swaying to and fro, the flight advancing one day to be driven back the next by fierce northern blasts. During the entire month practically no headway was made. A few stragglers managed to force their way northward for a short distance, reaching Danville, Ill.; Ferry, Iowa; Fayette, Mo.; Unadilla and Linwood, Nebr.; but the bulk made little movement, scarcely passing beyond the Gulf States; and the struggle was temporarily terminated about the 1st of March by a "second winter," which recongealed the open water and sent the Ducks back to winter quarters. At Waverly, Miss., the course of events, according to Major Young, was as follows:

> In both years, 1883 and 1884, Ducks went north at the same time, and under the same conditions. There was a big overflow of the Tombigbee river in February,

which brought immense numbers of Ducks. On February 12, 1884, they were going north in large flocks; February 14 they returned, coming back just at the time we had a cold wave from the north. We had fine Duck shooting until the storms of February 22 and 23, when they disappeared. The varieties killed were Pintails, Mallards, Gadwalls, Black Ducks, and Sheldrakes. By March 18 only a few Ducks were left.

At Saint Louis the thaw began March 9, and was fairly under way on the 10th. Ducks began to return, and the first real advance since February 1 was made March 10. By the 12th and 13th they had moved to latitude 41° 10′ in Illinois, and 41° 42′ in Iowa. The movement rapidly gained headway. The Ducks had been held back so much later than usual that as soon as a movement was possible it was participated in by the whole family. March 15 and 16 were great days for migration, aided by a warm south wind. The movement was peculiar in that the bulk was almost abreast of the van. The first had not yet appeared in Wisconsin, the most northern record being Polo, Ill. (lat. 41° 58′), but the bulk was only a few miles in the rear, being recorded from latitude 41° 36′. In Iowa the van was at latitude 42° and 42° 1′, and the bulk in all favorable localities from latitude 41° 40′ southward. In the West the van had come to Vermillion, Dak. (lat. 42° 56′), and the bulk to Linwood, Nebr. (lat. 41° 22′).

From this time on each day was marked by a record of advance. Southern Wisconsin was reached March 18; northern Iowa and southern Minnesota on the 20th and 21st. March 23 was the day of an immense flight of about a dozen species at Heron Lake, Minn., all coming from the west as if from the Missouri valley, at the nearest point of which they had arrived some days previously. On this day also they reached Waupaca, Wis., latitude 44° 22′. During the next three days the records show advances in Minnesota and Dakota to latitude 45° 25′ in the former, and up the Missouri river to latitude 46° 58′ in the latter.

They were reported at Frazee City, Minn. (lat. 46° 33′), March 31; at Argusville, Dak. (lat. 47° 08′), the day before; at Two Rivers, Manitoba (49° 28′), April 12, and Oak Point, Manitoba (50° 30′), April 16. There were not many records of the arrival of the bulk in the North, but they indicate that the bulk and van kept pretty close together up to about latitude 45°, when the van pressed forward, while the bulk was delayed by April storms.

Returning to the South, we find that the bulk left Louisiana and Texas about the middle of March; they left latitude 39° the last of March and the first week in April, and latitude 43° about the third week in April. North of this parallel so many Ducks remained to breed that no departures were given.

In the fall of 1884 the first migrant appeared at Des Moines, Iowa, October 1, and at Emporia, Kans., October 9. At the latter place it had become common by the 25th of October, and was last seen December 1.

For the spring of 1885 all notes giving the arrival of "Ducks," with no specific name have been brought under this head, as was done in treating of spring migration in 1884. No notes were contributed on the movements of Ducks south of latitude 38° ; hence nothing can be said of their whereabouts until the first full wave of migration brought them to Cimarron, Kans., February 26. The next day they were seen at Shawneetown, Ill. This was the opening day of spring migration at Saint Louis, Mo. The advance continued for several days. Ducks were reported from Griggsville, Ill., February 28; and during the first five days of March, from Mount Carmel, Mo., and Fayette, Mo. (two observers); Ferry, Iowa; Mount Pleasant, Iowa; Knoxville, Iowa; Sioux City, Iowa; Emporia, Kans.; and Unadilla, Nebr. It will be noticed that this is the same bird wave which is described under the migration of the Canada Goose, but while the Geese pushed on into Dakota, no Ducks were noted north of Sioux City. Yet, contrary to the usual rule, the van in the West was farther north than in the East, just as it was with the Geese, and this difference became still more pronounced when the next wave (that of March 11) carried the advance guard along the plains to Heron Lake, Minn., while nearer the Mississippi it pushed forward but a few miles to Morning Sun, Richmond, Newton, and Grinnell, Iowa. Immense numbers of Ducks were on the wing March 11 throughout the country from Griggsville, Ill., to Newton, Iowa; but very little northward advance was made. During the spring migration of 1884 it was noted by Mr. Miller that Ducks came to Heron Lake, Minn., from the west, as if they were a part of the Missouri river flight. In 1885 they must have come from the same direction, since in the region south of Heron Lake, in Iowa, at an equally favorable locality (Emmetsburgh), none were seen until about two weeks later. There can be no doubt that in the spring of 1885 the flight of Ducks and Geese along the Missouri river was several days earlier than at corresponding latitudes on the Mississippi river. Another wave occurred in Iowa March 14. It was noted at Iowa City and Laporte City, Iowa, and by both observers at Tampico, Ill. The next day the temperature at Saint Vincent, Minn., was fourteen degrees below zero, and the hosts of Ducks in central Iowa returned south, following the example set March 14 by the Ducks at Heron Lake. They returned March 25, and were noted March 26 at Emmetsburgh and Williamstown, Iowa, Huron, Dak., and Stoughton, Wis. March 30 and 31 they appeared at New Cassel, Wis., Fridley, Minn., and Menoken, Dak. Thus the western flight extended still further north than the eastern. April 1 they were reported at Argusville, Dak.; April 5, at Larimore, Dak., and Two Rivers, Manitoba; and April 7 at our most northern station, Oak Point, Manitoba, in latitude 50° 30′.

In the fall of 1885 they were still at Heron Lake, Minn., as late as December 1. The last one was seen at Lanesboro, Minn., November 22; at Grinnell, Iowa, November 4; and at Fernwood, Ill., November 7. The first migrant was reported from Grinnell, Iowa, September 10; Fernwood, Ill., September 12; Iowa City, Iowa, October 6; Saint Louis, Mo., September 6, with an increase September 22; Shawneetown, Ill., October 3; Richmond, Kans., October 4; and from Bonham, Tex., October 16. At the last-named place Ducks became common November 4.

133. **Anas obscura** Gmel. [602.] *Black Duck.*

Though principally a bird of the Eastern States the Black Duck is not rare in the northern part of the Mississippi Valley. In winter it occurs in the Gulf States. It is rare in western Manitoba. According to the reports of observers, it is resident in Louisiana and Texas;* and it breeds in Iowa and Illinois, but not in Kansas or Nebraska. In 1884 it arrived at Frazee City, Minn., April 1. In the fall of 1884 the first migrant appeared at San Angelo, Tex., August 3. In 1883 the first was seen there August 8.

In the spring of 1885 it arrived at Fayette, Mo., April 1, and a female at Gainesville, Tex., April 24.

In the fall of 1885 the first came to Fernwood, Ill., September 12; it was next seen there October 3, and last, November 7, on which date it was seen also at Shawneetown, Ill.

134. **Anas fulvigula** Ridgw. [603.] *Florida Duck.*

This Duck, originally described from Florida, has been found in Kansas, and doubtless occurs regularly in Louisiana and eastern Texas, if not throughout the intermediate region.

Col. N. S. Goss, in his Revised Catalogue of the Birds of Kansas (1886), says of it: "Migratory; rare. Arrives about the middle of March. I captured a female at Neosho Falls, March 11, 1876, and have since shot one, and observed two others in the State" (p. 6).

135. **Anas strepera** Linn. [604.] *Gadwall.*

The Gadwall is widely distributed, ranging over most of the northern hemisphere. It winters abundantly in the Gulf States, and sometimes remains in Illinois in mild winters; it is also known to winter near a warm spring in Wyoming. It breeds locally throughout most of its range. Col. N. S. Goss considers it a rare breeder in Kansas. At Moss Point, Miss., it comes in November and leaves in February. In 1884 it arrived at Ellis, Kans., March 14, Manhattan, Kans., March 19, and Saint Louis March 21, furnishing a curious exception to the usual rule that western birds arrive later than eastern. It arrived at Heron Lake, Minn., March 23, and remained to breed. In the fall of 1884 the first migrant was seen at Des Moines, Iowa, October 28, and the last November 10.

In the spring of 1885 it was reported from Emporia, Kans., and Heron Lake, Minn., March 29; from Des Moines and Laporte City, Iowa, April 1 and 3, and from Shell River, Manitoba, May 12. In the fall of 1885 the last was seen at Heron Lake, Minn., November 13.

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* Probably those which breed in Louisiana and Texas really belong to the next species, *A. fulvigula.*

136. Anas penelope Linn. [606.] *Widgeon.*

An inhabitant of the northern parts of the Old World; accidental in eastern North America; frequent in Alaska. Has occurred in Wisconsin (Kumlien), and Illinois (Nelson).

137. Anas americana Gmel. [607.] *Baldpate.*

The Baldpate ranges over the whole of North America. In winter it is common in the Gulf States and lower part of the Mississippi Valley. It breeds chiefly in the North, but is known to breed in Manitoba, Dakota, Minnesota, Nebraska, Kansas, Illinois, and Texas. Its movements in migration resemble those of the Gadwall. In the fall of 1884 it was first seen at Emporia, Kans., October 12.

In the spring of 1885 it reached Emporia, Kans., March 21; Des Moines, Iowa, March 23; Heron Lake, Minn., March 26; Emmetsburgh, Iowa, April 1, and Menoken, Dak., April 5. In the fall of 1885 it was last seen at Heron Lake, Minn., November 13. The first fall migrant appeared at Saint Louis, Mo., October 16.

139. Anas carolinensis Gmelin. [612.] *Green-winged Teal.*

Breeds in Manitoba and along our northern border, and winters in the Southern States and southward. Like the Mallard, this is a hardy Duck, and remains in winter just as far north as open water extends, which is usually to southern Kansas and southern Illinois. In the winter of 1883–'84 it probably did not stay much north of Caddo, Ind. Ter., southern Missouri, and northern Mississippi, but moved northward the last of January. At Moss Point, Miss., it arrived from October 15 to October 31 and was abundant; it then passed south to return in bulk during April. In 1884 the real movement began in early March, and by the 8th it had advanced to Manhattan, Kans., and Danville, Ill., and also to Vermillion, Dak. March 22 found it at Huron, Dak.; March 24 at Heron Lake, Minn., and the bulk arrived at Two Rivers, Manitoba, April 17. In the fall of 1884 the bulk arrived at Des Moines, Iowa, October 25, and the last left there November 17. In 1883 the first reached San Angelo, Tex., September 20.

In the spring of 1885 the record of its northward migration was too irregular to be of much value. The following notes will give the general outline of its movements in the West: It was recorded from Emporia, Kans., March 13; Des Moines, Iowa, March 18; Heron Lake, Minn., March 26; Huron, Dak. (both observers) and Menoken, Dak., April 7; Shell River, Manitoba, May 2. It was seen in pairs at Fernwood, Ill., May 2, and probably was nesting there. In the fall of 1885 the first was seen at Bonham, Tex., October 4; at San Angelo, Tex., September 20; at Des Moines, Iowa, September 10, and at Saint Louis, Mo., September 22. The last at Heron Lake, Minn., was seen November 13. None were seen at Des Moines, Iowa, after November 4.

140. Anas discors Linn. [609.] *Blue-winged Teal.*

Breeds in Manitoba and the northern part of the Mississippi Valley, and winters from the Southern States southward. At Moss Point, Miss., it is said that this species "comes from October 15 to November 1; remains only a short time; goes farther south, and passes north in April." This is true of the bulk of the species, but some flocks can be found throughout the winter in all the Southern States and north to southern Illinois. Dr. J. C. Merrill states that at the mouth of the Rio Grande, in extreme southeastern Texas, "a few remain during the winter, but the great majority go farther south, returning about the middle of March." In 1884 it was reported as breeding in Kansas, Nebraska, Iowa, Illinois, Minnesota, and Dakota; and it breeds locally throughout most of the rest of its range. In migration in the spring of 1884 it was the most abundant Duck passing over Pierce City, Mo., the first of February, but made no real headway until March. The bulk reached Newton, Iowa, March 17, spreading over the rest of Iowa, and arriving at Heron Lake, Minn., by April 2. It is not usually found among the first arrivals of Ducks, but surpasses them all in numbers when the main flight comes. It reached Vermillion, Dak., April 11, Menoken, Dak., April 20, and was reported from Portage la Prairie, Manitoba, April 16.

In the fall of 1884, at Des Moines, Iowa, the last was seen November 10. The first migrant reached Emporia, Kans., August 30; the next September 22, and it became common October 12. At San Angelo, Tex., it was first seen August 10, and was common on the 10th and 21st of September. In 1883 it had appeared there September 1, and became common by September 20.

In the spring of 1885 the first flight of Ducks over the district between latitude 39° and latitude 42° was so delayed that the Blue-winged Teal came with the van; but north of latitude 43° it assumed its usual position as one of the later migrating Ducks. At Shawneetown, Ill., it was first seen February 23; at Cimarron, Kans., March 1; Fayette, Mo., March 10; Emporia, Kans., March 29; Des Moines, Iowa, April 4; Sioux City, Iowa, April 5; Heron Lake, Minn., April 11; Huron, Dak., April 14; Menoken, Dak., April 22; Shell River, Manitoba, May 2.

The Blue-winged Teal breeds over so much of the Mississippi valley that it is difficult to trace its southward migration. In the fall of 1885 the first was recorded from Grinnell, Iowa, September 10; Ellsworth, Kans., September 15; Emporia, Kans., September 1; Saint Louis, Mo., where it became numerous three days later, September 1; Shawneetown, Ill., September 28; Bonham, Tex., October 4; San Angelo, Tex., September 4. They were common at Grinnell, Iowa, October 4; Ellsworth, Kans., October 15; Saint Louis, Mo., September 22, where they were still numerous October 24; Bonham, Tex., October 28. The last was seen at Heron Lake, Minn., November 9; Milwaukee, Wis., November 14; and Grinnell, Iowa, November 4.

141. Anas cyanoptera Vieill. [610.] *Cinnamon Teal.*

This western Teal is not uncommon in middle and western Kansas, where it probably breeds (Goss). It has been found repeatedly in western Texas, where it is a rare fall migrant; it occurs in migration in eastern Texas, but is not common (Nehrling), and is not rare during migration near the mouth of the Rio Grande (Merrill). It is an occasional visitant in Manitoba, Minnesota, Nebraska, Illinois, and Louisiana. In 1883 it reached Emporia, Kans., March 22.

142. Spatula clypeata (Linn.). [608.] *Shoveller.*

Winters from southern Illinois southward; breeds abundantly in the Northern States and Manitoba, and sparingly in Texas, northern Illinois, and Kansas. Breeds in great numbers at Heron Lake, Minn. Its time of migration is one or two days behind that of the Gadwall. In the fall of 1884 the first Shoveller was reported from Des Moines, Iowa, and San Angelo, Tex., October 28; and from Emporia, Kans., October 24.

In the spring of 1885 an early migrant was seen at Sioux City, Iowa, March 27. The regular advance was reported March 31 and April 1 from Fayette, Mo., Des Moines, Iowa, Laporte City, Iowa, and Fernwood, Ill. The first was seen at Emporia, Kans., April 4; at Lanesboro, Minn., and Menoken, Dak., April 19, and Shell River, Manitoba, May 8. In the fall of 1885 the last at Heron Lake, Minn., was seen November 13.

143. Dafila acuta (Linn.) [605.] *Pintail; Sprigtail.*

Breeds in Manitoba and the northern tier of States, and, like the other river Ducks, is common during the winter in the Gulf States, and occasionally as far north as Illinois, but it also goes much further south. It is one of the earliest Ducks to migrate and was one of the most abundant of those which so strenuously endeavored to work northward during February in 1884. It came to Pierce City and Saint Louis, Mo., January 31 and February 1, and February 26 more than 50 flocks, mostly of this species, passed over Saint Louis. This movement was checked the last of February, and commenced again March 8 and 9, bringing the species to Ellis and Manhattan, Kans., Storm Lake, Iowa, and Vermillion, Dak. Those which wintered south of the United States arrived in bulk at Moss Point, Miss., March 15, and remained until about the middle of April. March 12 to 15 were days of movement in Illinois, and Pintails spread over the whole of the State; March 23 they arrived at Heron Lake, Minn.; and April 16 they were noted at Portage la Prairie, Manitoba. They breed principally in British America, but also at Spirit Lake, Iowa, Heron Lake, Minn., and sparingly in Illinois.

In the fall of 1884 the first Pintail was seen at Des Moines, Iowa, October 15, and the last November 15. The first was seen at San Angelo, Tex., September 19. In 1883 the first reached San Angelo September 12.

A few Ducks of this species spent most of the winter of 1884–'85 at Shawneetown, Ill. The only record of their wintering further north than Shawneetown was received from Mr. W. B. Hull, of Milwaukee, Wis. Mr. Hull writes:

> For about a week the whole bay was frozen over with ice from 12 to 14 inches thick. During this time the pot-hunters butchered numbers of Pintail Ducks. The Ducks were half starved and would allow a man to approach within 20 feet of them. Icemen were cutting ice close to the shore, and Ducks came right among them to get to the open water. A friend who was on the ship Oneida during her twenty-five days in the ice, said that the Ducks (Pintails mostly, but a few "northern" ducks, he did not recognize), were "frozen in." When walking on the ice near the boat he saw hundreds of Ducks in a solid casing of ice. In the winter of 1873-'74 they were killed in the same way.

In the spring of 1885 migration began during the last week of February. Flocks of about 400 birds passed Cimarron, Kans., February 26. The next day several flocks of Pintails, "the first ducks of the season," passed over Saint Louis, Mo. Large numbers were seen at Shawneetown, Ill., February 28. Concerning their presence at Saint Louis on that day Mr. Widmann writes:

> From 7 a. m. till noon an almost steady stream of ducks passed over in flocks of from 30 to 60, the larger part being Sprigtails, so far as I could see. There was hardly any time when at least one flock could not be seen in some direction, but oftener half a dozen could be counted at the same time. Many flocks followed the Mississippi, but the majority turned off to the west just south of the city, in order to reach the Missouri river, or the large tracts of land between the mouths of the Missouri and Illinois rivers. Thousands have passed this city to-day.

As in the case of most of the other ducks, during the spring migration of 1885, the flight west of the Mississippi was more rapid than on the east. March 2 flocks were seen at Emporia, Kans., where they were common March 3; March 4 they were seen at Sioux City, Iowa, and March 8, at Linwood, Nebr. March 11 to 14 they were noted from Aledo, Ill.; Tampico, Ill.; Newton, Iowa; Des Moines, Iowa; Laporte City, Iowa; and Heron Lake, Minn. March 26 there were "myriads" of them at Emmetsburgh, Iowa. The first flocks came to Fernwood, Ill., March 31. The bulk left Des Moines, Iowa, the night of April 2. They were very common at Heron Lake, Minn., March 30. The first came to Larimore, Dak., April 7; Menoken, Dak.; and Ossowo, Manitoba, April 7, and they were common all over Manitoba by April 20. In the fall of 1885 the first were seen at Fernwood, Ill., September 12, and at San Angelo, Tex., September 4. The last at Ossowo, Manitoba, was seen November 1, and at Heron Lake, Minn., November 9.

144. Aix sponsa (Linn.). [613.] *Wood Duck.*

A well-known inhabitant of temperate North America; breeds throughout the Mississippi Valley, and is resident from southern Illinois southward. In Manitoba it is a rare summer resident.

Mr. Wood writes that at Moss Point, Miss., the young hatch in March, and he has never seen a male of this species in summer. In the spring of 1884 it arrived at Saint Louis March 12; at latitude 40° 8′, in Illinois, March 15; at latitude 41° 40′, in Iowa, March 16; in Wisconsin, at latitude 44° 22′, March 23; and in Minnesota, at latitude 44° 32′, April

3. In the fall of 1884 the first migrant was reported from Des Moines, Iowa, October 18. The bulk arrived there October 25, and the last was seen November 10.

In the spring of 1885 the first Wood Ducks were seen at Shawneetown, Ill., February 27; at Mount Carmel, Mo., March 17; Des Moines, Iowa, March 19; Emporia, Kans., March 29; Laporte City, Iowa, March 26; and during the first five days of April they were noted from Heron Lake, Lanesboro, Lake City, Excelsior, Minneapolis, and Elk River, Minn., and from Durand, Wis. In the fall of 1885 they began to come out from their breeding places and fly on the river at Shawneetown, Ill., August 20. The last at Heron Lake, Minn., was seen October 13; at Saint Louis, Mo., the bulk arrived September 22.

146. Aythya americana (Eyt.). [618.] *Redhead.*

Breeds in Manitoba and the northern tier of States; range much the same as that of the Canvas-back, but more abundant than it in the Southern States. At Moss Point, Miss., in 1883, they came about the middle of November, and were abundant all winter. Mr. Wood, of Moss Point, says that about March 1 they collect on the islands, load themselves with sand, and when a favorable wind comes they go with it.* They were a common winter resident at San Angelo, Tex., and great flocks were still present March 5, 1884. March 8 they came to latitude 39° 12′, in Kansas; March 11 they were at latitude 38° 40′, in Missouri; March 12 at latitude 41° 40′, in Iowa; March 14 at latitude 38° 55′, in Kansas; March 15 at latitude 41° 36′, in Illinois; March 22 at latitude 42° 18′, in Iowa; March 24 at latitude 42° 56′, in Dakota, and at latitude 43° 48′, in Minnesota, at both of which places they breed; March 25 they were at latitude 41° 58′, in Illinois, and April 18 at latitude 44° 32′, in Minnesota. April 16 they came to Portage la Prairie, Manitoba.

In the fall of 1884 the first Redhead was seen at Des Moines, Iowa, October 10, and the last November 15. In 1883 the first came to San Angelo, Tex., where it is common in winter, October 1.

In the spring of 1885 the records were irregular. The species was recorded from Emporia, Kans., March 2; Heron Lake, Minn., March 29, and irregularly from intermediate points. The most southern breeding record came from Clear Lake, Iowa.

In the fall of 1885 the first was seen at Iowa City, Iowa, October 6, and the last at Heron Lake, Minn., November 26. At Saint Louis, Mo., the first was seen October 16, and the bulk arrived October 24.

147. Aythya vallisneria (Wils.). [617.] *Canvas-back.*

Rather rare away from the coast in winter, but has been known to occur in southern Illinois. A few breed at Heron Lake, Minn., and

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[* I have heard the same habit attributed to Ducks in Newfoundland and other places, but am not aware that there are any facts on which the notion is based.—C. H. M.]

thence northward. In the spring of 1884 they appeared at Gainesville, Tex., March 2; Manhattan, Kans., March 8; Saint Louis, March 11; and Heron Lake, Minn., March 24. At Waupaca, Wis., they were seen March 29, and at Vermillion, Dak., April 3. April 16 they were reported from Portage la Prairie, Manitoba.

In the spring of 1885 the first were seen at Emporia, Kans., March 18; at Heron Lake, Minn., March 30, where they were common the next day. They were reported from Laporte City and Emmetsburgh, Iowa, April 1; and from Menoken, Dak., and Ossowo, Manitoba, April 6 and 7. In the fall of 1885 the last left Heron Lake, Minn., November 27. Mr. Lloyd says that in Tom Green and Concho counties, Tex., they are tolerably common in early winter.

148. Aythya marila nearctica Stejn. [614.] *Blue-bill; Scaup Duck.*

After wintering in the Southern States, especially along the Gulf coast, the Big Black-head passes over the entire length of the Mississippi Valley, to nest in Manitoba and northward. In 1884 it was reported from Carlinville, Ill., February 13; Laporte City, Iowa, March 22, and the next day reached Heron Lake, Minn., where a few remained to breed. It arrived at Portage la Prairie, Manitoba, April 16.

In the spring of 1885 this was the only species of Duck whose record did not contain an irregular note. It was seen at Laporte City, Iowa, (lat. 42° 18′), March 27; Emmetsburgh, Iowa (lat. 43° 8′), March 30; Heron Lake, Minn. (lat. 43° 48′), April 1; Huron, Dak., (lat. 44° 21′, two observers), and Menoken, Dak. (lat. 46° 58′), April 3; and Shell River, Manitoba (lat. 50°), April 7. The most southern breeding record of this species was from Clear Lake, Iowa (lat. 43° 26′). In the fall of 1885 the last was seen at Heron Lake, Minn. (lat. 43° 18′), November 27.

149. Aythya affinis (Eyt.) [615.] *Little Blue-bill; Lesser Scaup Duck.*

Range much the same as that of the last, but known to breed as far south as Clear Lake, Iowa. It is an abundant summer resident in western Manitoba. In 1884 it came to Saint Louis, February 26, and after being driven away by the cold, returned March 11; advanced to Burlington, Iowa, March 12, and on the 24th was reported from Vermillion, Dak., Storm Lake, Iowa, Heron Lake, Minn., and Portage la Prairie, Manitoba.

In the fall of 1884 the first migrant appeared at Emporia, Kans., November 8.

In the spring of 1885 the notes on its migration were too irregular to be of any value. In the fall of 1885 the last was seen at Heron Lake, Minn., November 9. The first migrant appeared at Saint Louis, Mo., September 22. In western Texas it is tolerably common in winter.

150. Aythya collaris (Donov.). [616.] *Ring-necked Duck.*

This is known in northern Minnesota as the "Fall Duck," and is very abundant during fall migration. A few breed in Minnesota, at least as far south as Minneapolis, where its eggs have been taken by Dr. Thomas S. Roberts. It was reported as breeding at Clear Lake, Iowa, and thence northward. Its range is much the same as that of the Scaup Ducks. In 1884 it was seen at Saint Louis, Mo., and Manhattan, Kans., March 20 and 21, at Green Bay, Wis., March 26, and Red Wing, Minn., April 2. In the fall of 1884 the first migrant appeared at Emporia, Kans., October 24.

In the spring of 1885 the first was seen at Des Moines, Iowa, March 19, and at Heron Lake, Minn., April 1. The last was seen at Des Moines April 9, and at Heron Lake April 15. In the fall of 1885 the first was seen at Iowa City, Iowa, October 3, and at Emporia, Kans., October 10. The last record from Heron Lake, Minn., was November 9; and a few were still present at Lanesboro, Minn., November 30. Mr. Lloyd states that they are common in Concho county, Tex.

151. Glaucionetta clangula americana (Bonap.). [620.] *Golden-eye; Whistler.*

Breeds in the Northern States. During the winter the Golden-eye is found wherever there is open water, even as far north as the Great Lakes. It was seen on Lake Michigan (near Chicago) all winter in 1883–'84, and also winters on Lake Erie. A flock was reported as remaining all winter in an open creek near Fridley, Minn., but probably it was composed of Barrow's Golden-eye (*G. islandica*), which has been found often in Minnesota during the winter. In migration in the spring of 1884 the common Golden-eye reached Laporte City, Iowa, March 16, Heron Lake, Minn., March 23, and Green Bay, Wis., March 28. The bulk arrived at Green Bay April 15.

During the winter of 1884–'85 many Golden-eyed Ducks remained, as usual, at the southern part of Lake Michigan, near Chicago.

In the spring of 1885 migrants were noted at Laporte City, Iowa, March 30, Fernwood, Ill., April 4, Heron Lake, Minn., April 1, Green Bay, Wis., April 10, and Shell River, Manitoba, April 28.

152. Glaucionetta islandica (Gmel.). [619.] *Barrow's Golden-eye.*

A northern species, coming south in winter irregularly to Manitoba and the Upper Mississippi Valley. One was taken at Mount Carmel, Ill., in December, 1874 (Nelson), and one at Minneapolis, Minn., January 13, 1877 (Roberts). Dr. Roberts states that a few years ago, at the falls of Saint Anthony, in Minnesota, "a flock of these ducks used to spend the winter in the pool below the cataract."

153. Charitonetta albeola (Linn.). [621.] *Butterball; Buffle-head.*

Breeds at Clear Lake, Iowa, Heron Lake, Minn., and northward. Winters on Lake Michigan (at Chicago); on the Lower Missouri river, and southward. In eastern Texas it is abundant in winter near the coast (Nehrling). In 1884 the bulk arrived at Burlington, Iowa, March 13, and at Vermillion, Dak., the first were seen the same day. They arrived at Storm Lake, Iowa, and at Heron Lake, Minn., March 24.

March 25 they were seen at Polo, Ill., and April 4 at Red Wing, Minn.

In the spring of 1885 the first were noted at Shawneetown, Ill., February 27, Emporia, Kans., March 13, Des Moines, Iowa, March 24, Laporte City, Iowa, March 30, Fernwood, Ill., March 31, New Cassel and Luck, Wis, April 4, and Shell River, Manitoba, April 27.

In the fall of 1885 they returned to Fernwood, Ill., September 12, were common there October 3, and left Heron Lake, Minn., November 30. Rare in Concho county, Texas, where one was shot in the spring of 1886 (Lloyd).

154. **Clangula hyemalis** (Linn.). [623.] *Old-squaw.*

This and the six following species breed in the far North, entering the Mississippi Valley in winter only, and chiefly in the northern and middle portions, near the great rivers and lakes. The Old-squaw is found throughout Illinois in winter, and small flocks are occasionally seen during the fall migration at Saint Louis, Mo., Vermillion, Dak., and in Minnesota.

155. **Histrionicus histrionicus** (Linn.). [622.] *Harlequin Duck.*

The Harlequin Duck breeds in British America and migrates southward in fall. It is found throughout Illinois in winter, and has been taken at Saint Louis, Mo.

160. **Somateria dresseri** Sharpe. [627a.] *American Eider.*

Breeds along the Atlantic coast from Maine to Labrador; migrates south and southwest in winter, often reaching the Great Lakes. Has been taken in Illinois (Nelson), and Wisconsin (Hoy).

162. **Somateria spectabilis** (Linn.). [629.] *King Eider.*

Breeds in the northern portions of the northern hemisphere; in fall migrates south, occurring on the Great Lakes in winter. There are records from Illinois (Ridgway), and Wisconsin (Hoy).

163. **Oidemia americana** Sw. and Rich. [630.] *Black Scoter.*

Breeds far north, coming south in winter to the United States. It has been found at Saint Louis, Mo., and Laporte City, Iowa, and is a rare visitant to Minnesota. Mr. C. W. Butler writes that on May 2, 1883, he saw fifty at Anna, Ill., all busily engaged in picking up millet seed that had just been sown.

165. **Oidemia deglandi** Bonap. [632.] *White-winged Scoter.*

Generally distributed throughout Illinois in winter, but most common on Lake Michigan. Has been taken once at West DePere, Wis., twice in Minnesota, and once at Saint Louis, Mo.

166. **Oidemia perspicillata** (Linn.) [633.] *Surf Scoter.*

Occurs in winter on all the larger streams in Illinois, as well as on Lake Michigan. Has been taken at Saint Louis, Mo., and at Laporte City, Iowa.

167. Erismatura rubida (Wils.). [634.] *Ruddy Duck.*

The Ruddy Duck breeds over much of the Mississippi Valley, from Texas to Minnesota, and winters from southern Illinois southward. Dr. Watson recorded it from Ellis, Kans., in these words: "A variably common transient visitor; once a pair nested here." In the spring of 1884 the first was seen at Saint Louis February 26, and Vermillion, Dak., March 28. It was seen at Caddo, Ind. Ter., during fall migration, but not in the spring. In the fall of 1884 the first was seen at Emporia, Kans., October 24.

In the spring of 1885 the only note received was the record of its arrival at Emporia, Kans., April 18. In the fall of 1885 the last was seen at Heron Lake, Minn., November 7.

168. Nomonyx dominicus (Linn.). [635.] *Masked Duck.*

A tropical American species, accidental in the United States; one specimen taken at Lake Koshkonong in Wisconsin (Kumlien).

Chen cærulescens (Linn.). [590.] *Blue Goose.*

Breeds on Hudson Bay; migrates through the Mississippi Valley, and winters along the Gulf coast, in mild winters extending up to northern Mississippi and southern Illinois. During migration it was noticed at Burlington, Iowa, where the bulk arrived March 20, 1884.

169. Chen hyperborea (Pall.). [591a.] *Lesser Snow Goose.*

Breeds in Alaska; a regular migrant in the Mississippi Valley; winters abundantly on the Gulf of Mexico. In Kansas it is a common migrant, and a few sometimes winter. In 1884 it was reported from West DePere, Wis., and Alda, Nebr. In Tom Green and Concho counties, Tex., it is tolerably common during spring migration.

It migrates early. In 1884 large flocks were seen at Pierce City, Mo., by the last of January, and one flock had arrived at Saint Louis. No more were recorded until after the "second winter." At Caddo, Ind. Ter., it was first seen March 10. March 19 and March 20 it appeared at Manhattan, Kans., and again came to Saint Louis. March 21 it reached Vermillion, Dak., and four days later was at Huron, Dak. It was reported from Menoken, Dak., April 12, and the next day at Larimore. Farther east the bulk reached Burlington, Iowa, April 1, and the first came to Storm Lake, Iowa, March 25, the bulk following on the 14th, which was the day that the last was seen at Saint Louis.

In the fall of 1884 the first flock of Snow Geese was seen at Emporia, Kans., October 20, after which date the species was common there.

In the spring of 1885 it was noted from Richmond, Kans., March 4; Fayette, Mo., March 10; Unadilla, Nebr., March 11; Linwood, Nebr., March 25; Sioux City, Iowa, March 30; Huron, Dak., March 31; Grand View, Dak., April 1; Fernwood, Ill., April 4, and Two Rivers, Manitoba, April 14. In the fall of 1885 it returned to Argusville, Dak., September 20; to Saint Louis, Mo., October 27, and to Bonham, Tex., October 3. It was common at Argusville, October 4, and at Bonham October 23.

169a. Chen hyperborea nivalis (Forst.). [591.] *Greater Snow Goose.*

The eastern representative of the preceding; occurs in winter chiefly along the Atlantic coast, but sometimes enters the Mississippi Valley. In western Manitoba it was reported to be an abundant spring migrant, but less common in the fall (Thompson). Possibly the foregoing was mistaken for it.

171a. Anser albifrons gambeli (Hartl.). [593a.] *White-fronted Goose.*

Breeds in the far North; winters in the Gulf States and southward, in mild winters occurring as far north as southern Illinois. Migratory over the rest of the Mississippi Valley. In 1884 the first reached Manhattan, Kans., March 8, where they were common March 15. March 20 they arrived at Saint Louis; and April 1 at Vermillion, Dak. The bulk came to Storm Lake, Iowa, April 14.

In the spring of 1885 the first report of arrival was from Des Moines, Iowa, April 1. The only other notes were from Menoken, Dak., April 23, and Ossowo, Manitoba, May 11. In the fall of 1885 the last was seen at Heron Lake, Minn., November 2.

Dr. Agersborg says that in southeastern Dakota it is a rare migrant, "always found associating with the Snow Geese." Mr. Lloyd states that in Tom Green and Concho counties, Tex., it is "tolerably common in winter." Mr. Nehrling states that in eastern Texas, near Houston, it "is the first Goose to arrive from the North in autumn, but they all migrate further south."

172. Branta canadensis (Linn.). [594.] *Canada Goose.*

Winters in the southern half of the United States, and breeds on both sides of our northern boundary. It breeds regularly at Heron Lake, Minn., and has been known to breed in southern Illinois (Nelson). Such is a brief statement of its range, but the records in the winter of 1883-'84 furnish material for a more detailed statement. During December Geese were not uncommon up to latitude 38°, but during the extreme cold of January only stragglers could be found north of latitude 35°. January 11 a flock of 25 to 30 was seen at Vermillion, Dak., where they had never before been seen in winter. January 4 a flock of fifty passed over Manhattan, Kans., flying east. From Caddo, Ind. Ter., southward they were seen all winter, or at least every few days. The first movement took place in January. January 11 they passed over Yazoo City, Miss., flying north, and when the warm waves came the last of the month they pressed rapidly forward. They reached Saint Louis January 22. January 25 was a great day for Geese, many troops going north. February 1 they passed north over Pierce City, Mo., in large flocks, and arrived at Glasgow, Mo., Odin, Ill., and Unadilla, Nebr. February 4 the first movement was noticed at Abbeville, La., among the flocks which had been wintering there. But all this movement was cut short by the cold of February and the first week of March. During the rest of February there was but little movement and no real progress. Geese were reported during February from Richmond, Iowa, Osceola, Ill., and Linwood, Nebr., but were not noted from neighboring stations, and were not followed by more until March. They must be considered as irregular migrants possessed of more ambition than brains.

The real migratory movement dates from February 26. On this day the regular migrants began to pass over Eagle Pass, Tex., and the great bulk began to leave southern Louisiana. This wave reached Caddo, Ind. Ter., March 3; Darlington, Ind. Ter., March 5, and latitude 39° in Missouri and Illinois about the 10th. From this parallel northward the advance will be traced along the three lines of migration: east and west of the Mississippi, and along the prairie region. March 13 the flight advanced to latitude 41° 36′ in Illinois; March 15 to latitude 31° 51′ at Chicago, where a flock of over a thousand was seen flying east, probably aiming for the open waters of the lake; March 16 to latitude 41° 58′ in Illinois, and latitude 42° 37′ in Wisconsin; March 20 and 21 to latitude 43° 02′, 43° 06′, and 43° 47′ in Wisconsin. West of the Mississippi the record reads: March 13 the advance was at latitude 41° 05′, and latitude 41° 19′ in Iowa; March 12 it was at latitude 41° 38′ and 41° 42′ in Iowa; March 14 at latitude 41° 40′ and latitude 42° 01′ in Iowa; March 15 at latitude 42° and 42° 55′ in Iowa. Hence it appears that from the 12th to the 15th of March many Geese were passing through central Iowa. March 20 they were reported at latitude 43° 19′ in Iowa; March 22 at latitude 43° 43′ in Minnesota; and March 23 at latitude 44° 47′, 45° 05′, and 45° 25′ in Minnesota, and at Portage la Prairie, Manitoba (latitude 50°).

On the prairies the notes indicate arrivals, March 13, at latitude 42° 56′, in Dakota; March 20, at latitude 44° 15′, 44° 21′, and 46°, in Dakota; March 24, at latitude 46° 58′ and 47° 52′, in Dakota; and April 3, at Two Rivers, Manitoba, latitude 49° 28′.

The bulk passed through northern Illinois about March 19, through southern Wisconsin March 23, and the middle of the State March 27. It crossed Iowa from March 20 to March 22, and reached central Minnesota about the 1st of April. Still further west the bulk came to latitude 39°, in Kansas, about the middle of March, passed through Nebraska the 18th to 20th, and was uniformly reported in Dakota, up to latitude 46°, on March 24; and then, as if delayed by the April storms, was not given at latitude 46° 58′, in Dakota, until April 22. The bulk left southern Wisconsin about April 1, and Kansas the first week of the month. We can not help envying Mr. Powell, who writes, that April 11 they were gradually leaving Alda, Nebr., after coming all in a bunch, and that he killed forty in one day over decoys in the Platte river.

In the fall of 1884 the first migrant was reported from Mount Carmel, Mo., November 11. It first appeared at Emporia, Kans., September 25, and the species had become common there by October 20.

In the spring of 1885 few Geese left their winter home until the migration season had fairly opened; the winter had been too severe to invite them to remain north of their usual winter range. A flock was seen at Keokuk, Iowa, January 4, and another at Glasgow, Mo., January 6. At Shawneetown, Ill., they remained in large numbers most of the winter, though during the blizzards they disappeared for a few days. A few early migrants were noted at Fayette, Mo., February 2, and at Sedalia, Mo., February 9, but no pronounced movement took place until February 28. This was two days later than the movement commenced in 1884, and there was no similarity whatever in the order of advance for the two years, 1884 and 1885. In the spring of 1884 the van kept very nearly along the same parallel on all three lines of migration during its advance from latitude 39° to latitude 45°, while in 1885 the migratory movement was peculiar. If, with the eastern extremity of Lake Superior for a center, segments of circles are drawn over the Upper Mississippi Valley, the first extending from central Dakota to southern Illinois, the next from the northwest corner of Iowa to east central Illinois, a third passing through northeastern Iowa, and a fourth ending at Chicago, these lines would represent the progress of the advance line of Geese during the month of March, 1885. Nothing similar to this has been noticed in the movement of any other species during either 1884 or 1885. The records group themselves around four sets of dates, namely, March 1–5, March 10–12, March 26–27, and March 30–31. On the last day of February large numbers of Geese passed Saint Louis, and March 1 they were seen at Ellsworth, Kans. During the first five days of March they were noted at Griggsville, Ill., Mount Pleasant, Iowa, Ferry, Iowa, Knoxville, Iowa, Richmond, Iowa, Grinnell, Iowa, Newton, Iowa, Emmetsburgh, Iowa, Unadilla, Nebr., Linwood, Nebr. (a flock had been seen at Linwood as early as February 26), Sioux City, Iowa, and Grand View, Dak. March 6 they came to Paris and Aledo, Ill. March 10–12 they appeared at Tampico, Ill. (two observers), Morning Sun, Iowa, Iowa City, Iowa (two observers), Heron Lake, Minn., and Saint Cloud, Minn. March 26 and 27 they were noted at Williamstown, Iowa, Durand Wis., and Elk River, Minn. Not until the last days of March did they arrive at Batavia, Ill., Fernwood, Ill., Chicago, Ill., Delavan, Wis., and Lake Mills, Wis. The remaining records are: Menoken, Dak., March 26; Argusville, Dak., and Two Rivers, Manitoba, April 1, and Oak Point, Manitoba, April 7. In the fall of 1885 the last Goose was seen at Ossowa, Manitoba, November 28; at Heron Lake, Minn., December 1, and at Grinnell, Iowa, December 5. The first migrant was seen at Grinnell, Iowa, October 20; at Saint Louis, Mo., September 6; at Richmond, Kans., October 17; at Shawneetown, Ill., September 28; and at Bonham, Tex., November 11. The species became common at Richmond, Kans., November 12, and at Bonham, Tex., November 15.

Dr. Agersborg, writing of the Canada Goose in southeastern Dakota, states:

> Like the Snow Goose, it is becoming less common every year. In spring it arrives a week ahead of var. *hutchinsi*, and ten or twelve days earlier than the Snow Goose. The same order of migration is also noticed sometimes in the fall. It breeds here occasionally. The young have been hatched under hens and become very tame. I have several times been shown nests in trees, claimed by settlers to be the nests of Geese; but the "Geese" have invariably been found to be Cormorants (*Phalacrocorax dilophus*). Of the few nests of the Canada Goose found, the majority have been far away from any water, out on the prairies; but one nest was built among some large bowlders, 2 feet from the water's edge, on Lake Minnetonka, Minnesota. May not many, if not all, of the nests seen in trees by other observers have belonged to the Shag? (The Auk, Vol. II, 1885, pp. 287-288.)

172a. Branta canadensis hutchinsii (Sw. & Rich.). [594a.] *Hutchins's Goose.*

Has much the same winter range as the Canada Goose (*Branta canadensis*), but is more common in the Gulf States, and breeds only in the far North. It was reported as sometimes common at Ellis, Kans. Colonel Goss says of it in Kansas: "Migratory; abundant. A few linger into winter." In 1884 the bulk came to Vermillion, Dak., March 28. In the spring of 1885 one was shot at Gainesville, Tex., April 2.

172c Branta canadensis minima (Ridgway.) [594 b.] *Cackling Goose.*

The Cackling Goose breeds in Alaska, chiefly along the shores of Norton Sound and the lower Yukon. In winter it migrates south and southeast, sometimes reaching the Mississippi Valley. It has been killed as far east as Wisconsin.

173. Branta bernicla (Linn.). [595.] *Brant.*

Breeds within the Arctic Circle, coming south in the winter to the Mississippi Valley. During the winter of 1883–'84 this species was represented from Illinois southward by a few rare visitants. In the spring it was rare south of Minnesota, but by the time it reached that State its numbers had been increased by recruits from the southeast, and it became almost common.

There is much uncertainty in using the records concerning this species, because it is so commonly confounded with the Snow Goose, which is locally known as Brant all through the West. From the *few* records that can be depended on it would seem to have migrated at about the same time as *Branta canadensis.* At Oak Point, Manitoba, there was a large flight of Geese, given as "Brant," from May 16, to May 20, 1884.

174. Branta nigricans (Lawr.). [596.] *Black Brant.*

A bird of western Arctic America, sometimes straggling into the Mississippi Valley in winter. Mr. Lloyd states that it was shot in Tom Green county, Tex., in the winter of 1884.

177. Dendrocygna autumnalis (Linn.). [599.] *Black-bellied Tree-duck.*

A southern Duck whose northern limit is along our southern border. On the South Concho, in Texas, it is rare in fall (Lloyd). Both Dr.

Merrill and Mr. Sennett found it a rather abundant summer resident along the lower Rio Grande, in Texas. Dr. Merrill says of it:

> This large and handsome bird arrives from the south in April, and is soon found in abundance on the river banks and lagoons. Migrating at night, it continually utters a very peculiar chattering whistle, which at once indicates its presence. Called by the Mexicans *patos maizal*, or Cornfield Duck, from its habit of frequenting those localities. It is by no means shy, and large numbers are offered for sale in the Brownsville market. Easily domesticated, it becomes very tame, roosting at night in trees with chickens and turkeys. When the females begin to lay, the males leave them and gather in large flocks on sand-bars in the river. My knowledge of the breeding habits is derived from Dr. S. M. Finley, U. S. A., who had ample opportunity of observing these birds at Hidalgo. The eggs are deposited in hollow trees and branches, often at a considerable distance from water (2 miles), and from 8 to 30 feet or more from the ground. The eggs are placed on the bare wood, and are from twelve to sixteen in number. Two broods are raised, and the parent carries the young to water in her bill. The birds leave in September, but a few late broods are seen as late as November (Proc. U. S. National Museum, Vol. I, 1878, p. 169).

178. Dendrocygna fulva (Gmel.). [600.] *Fulvous Tree-duck.*

A tropical and subtropical species, coming north in summer to Texas and Louisiana. In southwestern Texas it is rather common. Near the mouth of the Rio Grande it is abundant (Merrill). Mr. Lloyd found it tolerably common in the winter of 1884 on the North Concho, in Texas. It was also given as common near the mouth of the Nueces river.

180. Olor columbianus (Ord). [588.] *Whistling Swan.*

Breeds in the far North; occurs in winter on the South Atlantic and Gulf coasts. Sometimes it winters abundantly on Galveston bay, Texas (Nehrling); and occasionally it winters in Illinois. In migration it is found in Missouri, Kansas, and northward. At San Angelo, Tex., Mr. Lloyd saw seven in January, 1884. The reports on its migration are very irregular, and all that can safely be said is that the species passed through the middle district in March, and reached Oak Point, Manitoba, May 4.

In the spring of 1885 some Swans of this species were shot in the vicinity of Saint Louis, Mo., March 24. In the fall of 1885 the last were seen at Heron Lake, Minn., November 13.

181. Olor buccinator (Rich.). [589.] *Trumpeter Swan.*

Winters abundantly and regularly on the Gulf of Mexico, and sometimes north to Illinois. Breeds from Iowa and Minnesota northward. It was reported as breeding near Newton, Iowa, and at Heron Lake, Minn., as well as along the Red River of the North. In 1884 it reached Heron Lake, Minn., April 3, and Larimore, Dak., April 15.

In the spring of 1885 Trumpeter Swans were reported from Shawneetown, Ill., March 19; Paris, Ill., March 31, and Heron Lake, Minn., April 7. A small flock, probably of this species, was seen at Mount Carmel, Mo., June 4 and 7. In the fall of 1885 it left Heron Lake, Minn., November 9. In western Texas it is tolerably common in winter (Lloyd).

182. Phœnicopterus ruber Linn. [585.] *Flamingo.*

Resident along the Gulf coast, whence reported by the most southern observers; also noted from Tom Green and Concho counties, Tex., where Mr. Lloyd found it in August, 1881, and July, 1882.

183. Ajaja ajaja (Linn.). [505.] *Roseate Spoonbill.*

A southern species, resident in the Gulf States; used to occur in the bottoms opposite Saint Louis. Mr. Nehrling states that it is common in the breeding season near Houston, in eastern Texas, and "particularly common on the prairie ponds in the northern part of Harris county."

184. Guara alba (Linn.). [501.] *White Ibis.*

An inhabitant of tropical America, coming north regularly to southern Indiana and southern Illinois (Ridgway). Dr. Agersborg shot a specimen and saw another in southeastern Dakota in May, 1879.

185. Guara rubra (Linn.). [502.] *Scarlet Ibis.*

A tropical American species. There is no record of its recent occurrence in the United States. It has been recorded from Florida, Louisiana, and Texas.

186. Plegadis autumnalis (Hasselq.). [503.] *Glossy Ibis.*

Strays less often than the last from its southern home; north only to Illinois. February 27, 1880, one was shot and two others seen at a small lake in southern Illinois, 7 miles from Saint Louis (Hurter, Bull. Nutt. Ornith. Club, Vol. VI, 1881, p. 124). Has been seen at Saint Louis, Mo.

187. Plegadis guarauna (Linn). [504.] *White-faced Glossy Ibis.*

A bird of tropical America, coming north regularly to Texas. Mr. Sennett and Dr. Merrill found a large colony breeding near Brownsville, in the valley of the lower Rio Grande, during the middle of May, 1877. It has been shot once in Kansas, near Lawrence (in the fall of 1879, Goss.).

188. Tantalus loculator Linn. [500.] *Wood Ibis.*

The Wood Ibis is a southern bird, common in all marshy localities near the Gulf coast. A few ascend the Mississippi Valley, where they have been taken in Indiana, Illinois, Missouri, Wisconsin, and Kansas. They are rare and irregular, however, and almost nothing is known of their breeding range north of the Gulf States. Though reported by the observers as occurring at various times of the year, no Ibises were noted in actual migration.

189. Mycteria americana Linn. [499.] *Jabiru.*

A tropical American bird, occurring as far north as southern Texas.

190. Botaurus lentiginosus (Montag.). [497.] *Bittern.*

A common summer resident in Manitoba and the Northern States; less common farther south. In mild winters the Bittern remains in the middle portions of the Mississippi Valley, but ordinarily it passes south of latitude 35°. It is among the first of the Herons to migrate, appearing as soon as the frost is fairly out of the marshes. The notes contributed on its northward progress were very irregular. This is due probably to the conditions of observation rather than to any erratic movements on the part of the birds. To find them the observer must go to their chosen haunts; they will not come to him.

In the spring of 1884 two sets of notes were received. Those in March gave the extension of the species to southern Minnesota by the 25th; the other set, going over the same ground, gave its arrival from the middle to the last of April and the first week in May. It is possible that both are right, there being a small flight in the latter half of March, which, after being checked by the storms of early April, was followed later by the main body. Bitterns were reported from central Minnesota May 4, and from Oak Point, Manitoba, May 15. They nest principally north of latitude 40°, but small numbers have been found in summer as far south as Mississippi, and probably a few breed throughout their range.

In the spring of 1885 thirty-five notes were contributed on the movements of this species, but they are too irregular to be of use. The extremes were: Tampico, Ill., April 8, and Shell river, Manitoba, May 4.

In the fall of 1885 the first migrants arrived at Fernwood, Ill., September 13, and were common there the next day. At San Angelo, Tex., where it is a common fall migrant, the first were observed September 4. The last was seen at Fernwood, Ill., October 10, and at Heron Lake, Minn., November 3.

191. Botaurus exilis (Gmelin). [498.] *Least Bittern.*

The range of the Least Bittern is much the same as that of the Great Bittern, excepting that it is a more southern species. It breeds from Louisiana and Texas to Minnesota. In the spring of 1884 it was somewhat later in migration and did not reach the middle districts until the first week in May.

In the spring of 1885 the first was seen at Fernwood, Ill., May 17; Emporia, Kans., and Heron Lake, Minn., May 19, being thus more than two weeks later than the Great Bittern at the same places. A nest with eggs was found at Des Moines, Iowa, May 26.

In the fall of 1885 the last was seen at Fernwood, Ill., August 29. In Tom Green and Concho counties, Tex., it is a common fall migrant (Lloyd).

Ardea wuerdemanni Baird. [486 in part.] *Würdemann's Heron.*

An inhabitant of southern Florida; accidental in southern Illinois (Mount Carmel, September 11–22, 1876. Ridgway.)

194. Ardea herodias Linn. [487.] *Great Blue Heron.*

In summer this Heron occupies suitable localities throughout the whole of the Mississippi Valley. It is rare in Manitoba. It is resident and most common in Florida and along the Gulf coast. It winters in the Southern States, and occasionally, in mild winters, a few stay in southern Illinois. In the winter of 1883–'84, there was no record north of latitude 35°. Three were seen at Caddo, Ind. Ter., February 11, flying south, but probably were not winter residents, as a reliable hunter tells me that in eight years of residence there he has only once or twice known it to occur in winter, and then in the mildest seasons. The winter of 1883–'84 was anything but mild. In the spring of 1884 the regular 'firsts' were seen at Caddo March 18, about the same time that they began to appear at stations near the Mississippi. On March 12 they came to Alton, Ill.; three days later they were noticed at Burlington, Iowa; March 21 a report came from Ferry, Iowa; they were seen at Laporte City, Iowa, March 24; at Heron Lake, Minn., April 3; and on April 6, they reached Lake City, Minn., and Green Bay, Wis.; April 20, they were reported in the west at Ellis, Kans., and Alda, Nebr.

In the spring of 1885 the notes on the Great Blue Heron were much more irregular than in 1884. It was noted March 4, at Paris, Ill., and March 7 at Shawneetown. Both of these must have been very early migrants, for, with the exception of March 17 at Richmond, Kans., no others were recorded until the last two days in March. During the week from March 30 to April 5, they were noted without any irregularity from Saint Louis, Mo.; Fayette, Mo.; Sioux City, Iowa; Heron Lake, Minn.; Elk River, Minn.; Peoria, Ill.; Aledo, Ill.; Hennepin, Ill.; Rockford, Ill.; and Durand, Wisconsin. April 15 they reached Huron, Dak.

In the fall of 1885 the first migrants appeared at Fernwood, Ill., July 26; Emporia, Kans., August 2; Mount Carmel, Mo., October 1; and Bonham, Tex., July 12. None were seen at Fernwood after July 28; or at Grinnell, Iowa, after September 28. At Mount Carmel, Mo., they were common October 3, and disappeared October 20. The last left Saint Louis, Mo., October 6. August 21 was the date of the last seen at Bonham, Tex. Mr. Lloyd states that the species is a resident in Tom Green and Concho counties, Tex.

196. Ardea egretta Gmelin. [489.] *Great White Egret.*

A more southern species than the Great Blue Heron; breeds abundantly near the Gulf in swamps and prairie ponds. The few which leave the vicinity of the sea-coast straggle up the Mississippi, even to Minnesota. The greatest wanderers are the young, which in the fall often stray *northward* into regions where the species is not known to breed. Professor Lantz has seen them at Manhattan, Kans., and there are other records for the State, but they are not known to breed within its limits. There is one record from southeastern Nebraska. In southern Illinois it is known to breed.

In 1885 two of these Egrets were killed, out of a flock of six, at Chicago, Ill., July 27. One was seen at Bonham, Tex., July 12, and eleven at the same place July 15. In the fall of 1885 numbers were present at Saint Louis, Mo., on the 15th and 16th of August. At Fernwood, Ill. the last were noted August 8; at Emporia, Kans., August 14; Saint Louis, Mo., September 11; and Bonham, Tex. August 15. "White Herons" and "Snowy Herons" were reported from Peoria, Ill., March 20; from Sioux City, Iowa, March 30, common, April 7; and from Richmond, Kans., November 3. Just which species was seen is doubtful.

197. Ardea candidissima Gmelin. [490.] *Snowy Heron; Little White Egret.*

The range of this species is much the same as that of the last. It is exceedingly abundant in the marshes near the Gulf coast. In 1884 it was reported only from Grand Ridge, Ill., where the first was seen April 19. It is resident in western Texas (Lloyd). Colonel Goss says it is not uncommon in Kansas, arriving from the south in July and August, and returning in September.

198. Ardea rufescens Gmelin. [491.] *Reddish Egret.*

A southern species, breeding in large colonies along the coast of Texas. "A summer visitant to southern Illinois, not known to breed" (Ridgway).

199. Ardea tricolor ruficollis (Gosse). [492.] *Louisiana Heron.*

An inhabitant of the Gulf States. Near Houston, in eastern Texas, it breeds in swampy woods, but is not very common (Nehrling). Along the lower Rio Grande, in Texas, it breeds abundantly (Merrill and Sennett); but Dr. Merrill thinks it passes the winter farther south. It has been reported once from Indiana (Nelson).

200. Ardea cœrulea Linn. [493.] *Little Blue Heron.*

Like the last, this species is exceedingly abundant in the marshes near the Gulf coast. It is not known to breed in Kansas, though it has been seen there in July, August, and September. The northward fall migration spoken of under the White Egret is again seen in this species. A few breed in southern Illinois, and in the fall large numbers come there from the South, making it for a time an abundant species. It rarely, if ever, occurs north of latitude 40°. I made the acquaintance of this species in the summer of 1884 at Red Rock, Ind. Ter. No nest was found, but old birds were seen every few days all summer long near a small stream. This species was not noted in 1885 by any of the observers except at Bonham, Tex. One in white phase was sent me, which had been secured there July 16. Ten birds were seen July 21, but whether in white or blue plumage was not stated. The last was seen August 24. It was recorded by Mr. Lloyd as a resident at San Angelo, Tex., where it was particularly abundant in fall migration.

201. Ardea virescens Linn. [494.] *Green Heron.*

The habitat of this Heron agrees closely with that of *Ardea herodias*, but in most places it is a more common species. Like the Great Blue Heron it breeds over all of the Mississippi Valley and remains close to the Gulf coast in winter. It migrates later, and did not appear in the middle districts until late in April. At Danville, Ill., one was seen April 21; at Saint Louis, Mo., and Des Moines, Iowa, it was noted April 26; at Manhattan, Kans., April 29; and by May 1 it had arrived over all of Illinois and Iowa, and had come to Lanesboro, Minn. At Alda, Nebr., it was seen May 3.

In the fall of 1884 the bulk departed from Des Moines, Iowa, August 26, and none were seen afterwards.

In the spring of 1885 the records of the arrival of this species were very irregular. It was recorded from Saint Louis, Mo., April 28, and Lanesboro, Minn., April 23, with much later dates scattered over the intervening country. In the fall of 1885 the last was seen at Grinnell, Iowa, September 28, and at Saint Louis, Mo., September 14. The first was seen at Emporia, Kans., October 3.

202. **Nycticorax nycticorax nævius** (Bodd.). [495.] *Black-crowned Night Heron.*

The common Night Heron breeds throughout the Mississippi Valley, and winters both on the Gulf coast and south of it. In mild winters a few have sometimes been seen in southern Illinois. In the spring of 1884 the first record came from Rodney, Miss., March 22, when they were heard squawking at night as they passed over the city. On April 5 they appeared at Laporte City, Iowa, and two days later came to Heron Lake, Minn., which is the summer home of great numbers. They also breed abundantly in a large marsh in east-central Wisconsin. Colonel Goss says they are rare in Kansas.

In the spring of 1885 the records of the Black-crowned Night Heron were very irregular, as was the case with all the other Herons. Probably the species is better known at Heron Lake, Minn., than at any other station; it arrived there April 12, and fifty were seen April 17. All the rest of the notes came from places south of Heron Lake, and were of later date, except one from Gainesville, Tex., April 10. The last was seen at Saint Louis, Mo., April 22.

In the fall of 1885 the last was seen at Grinnell, Iowa, September 28; none were reported from Richmond, Kans., after October 15, but the last did not leave Heron Lake, Minn., until November 14.

203. **Nycticorax violaceus** (Linn.). [496.] *Yellow-crowned Night Heron.*

The present species is more southern than the last, finding its northern limit in Kansas, Missouri, Illinois, and southern Indiana.

Four days after the Black-crowned Night Heron flew over Rodney, Miss., in the spring of 1884, it was followed by the Yellow-crowned (March 26).

204. **Grus americana** (Linn.). [582.] *Whooping Crane.*

Nests along our northern border, and also in central Illinois; winters along the Gulf coast and as far north as the central part of Texas, where a few flocks were seen at San Angelo by Mr. Lloyd, who tells us that the Nueces cañon is the winter home of countless myriads. "From November to the end of March these beautiful birds are exceedingly abundant on all the low prairies in the vicinity of Houston" (Nehrling). In the spring of 1884 migration began in February, and by March 5 all had left San Angelo. They arrived at Manhattan, Kans., March 18, and the last week in the month they passed through central Iowa. March 30 a good many came to Heron Lake, Minn., and May 1 they arrived at Oak Point, Manitoba.

In the spring of 1885 the Whooping Crane appeared at Emporia, Kans., March 18; Richmond, Kans., March 21; Mount Carmel, Mo., March 25; Laporte City, Iowa, March 30; Emmetsburgh, Iowa, March 23; Heron Lake, Minn., March 31; Menoken, Dak., April 5; Oak Point, Manitoba, April 15. It was common at Bonham, Tex., March 23; at Gainesville, Tex., March 31; Emmetsburgh, Iowa, April 1; Heron Lake, Minn., April 3; Menoken, Dak., April 14; and Oak Point, Manitoba, April 17. It has been known to breed at Clear Lake, Iowa. In the fall of 1885 it returned to Bonham, Tex., November 9, and large flocks were seen November 16.

205. **Grus canadensis** (Linn.). [584.] *Little Brown Crane.*

Breeds in the far North, from Hudson bay to Alaska, coming south in winter to Mexico, migrating over the Great Plains. Mr. Ridgway informs me that in the National Museum collection there is a specimen from Texas.

206. **Grus mexicana** (Müll.). [583.] *Sandhill Crane.*

The Sandhill Crane is known to breed in Florida, but was not recorded as a summer resident in Mississippi. West of the Mississippi River it breeds in Louisiana and Texas, and thence northward to Manitoba, though it is not known to breed in Indian Territory or Kansas. But at Alda, Nebr., it nested in July, 1881; and in 1882 five birds stayed there all winter. It is known to breed in Iowa, Minnesota, and Dakota. Mr. Lloyd says that in western Texas it is an abundant spring and fall migrant. Mr. Nehrling says he has "observed flocks of many hundreds on the low prairies in the western and northern parts of Harris county," in eastern Texas.

In winter it is found along the Gulf coast, from Florida to Texas. In warm winters it is found as far north as Waverly, Miss., and in Texas up to San Angelo, where a few flocks were seen. In the spring some pass north to higher latitudes, while others remain to breed.

Migration commences very early. At Yazoo City, Miss., they were seen flying north January 9 and 11; at Caddo, Ind. Ter., the first came February 26 and more flocks March 3. March 15 they came to Unadilla, Nebr.; two days later to Linwood, Nebr.; April 7 to Huron, Dak., and April 12 to Menoken and Larimore, Dak. They reached Two Rivers, Manitoba, April 15, and April 19 they were at Oak Point, Manitoba. Thus their record in the West was quite uniform and regular. Further east they appeared at Saint Louis March 16, and on the 21st and 22d were reported from four stations in central Iowa. March 24 they arrived at Storm Lake, Iowa, and the last day of the month at Heron Lake, Minn. The records east of the Mississippi were few and irregular; between March 20 and March 24 they were seen from Griggsville, Ill., to Merritt's Landing, Wis.

In the spring of 1885 all but three of the stations on the plains contributed notes on the arrival of the Sandhill Crane, while from the region east of the Mississippi river but four stations reported it. The more regular of these records are as follows: Richmond, Kans., March 11; Linwood, Nebr., March 14; Grinnell and Newton, Iowa, March 25 and 26. From March 29 to April 1 it appeared at Des Moines, Laporte City, and Emmetsburgh, Iowa; Unadilla, Nebr.; and Aledo, Tampico, and Hennepin, Ill. April 4 it was seen at Elk River, Minn.; April 7 at New Cassel, Wis.; April 12 at Menoken, Dak.; April 15 at Larimore, Dak., and Oak Point, Manitoba. In the fall of 1885 the first came to Argusville, Dak., October 2; Richmond, Kans., October 3; and Bonham, Tex., October 5. The last were seen at Richmond, Kans., November 3; Grinnell, Iowa, November 4; and Fayette, Mo., November 20.

208. Rallus elegans Aud. [569.] *King Rail.*

Winters in the southern States, occasionally north even to southern Illinois, and in summer passes up the Mississippi Valley to Kansas and Missouri regularly, and to Iowa, Minnesota, and Wisconsin occasionally. It is not common in Nebraska, and is still rarer in southeastern Dakota, where Dr. Agersborg has found it to be a rare summer resident. As in all other species of Rails, its migrations are performed at night, and during the day it keeps so secluded in the thick sedges that, though not at all uncommon in much of its range, it is rarely seen. In the spring of 1884 it appeared at Saint Louis April 10; the only other record came from one of the most northern points at which it has ever been found: Hastings, Minn., May 9.

In the spring of 1885 the King Rail arrived at Emporia, Kans., April 14, and at Aledo, Ill., April 23. It reached Heron Lake, Minn., about the middle of May, but the exact date was not recorded. In the fall of 1885 it was first noticed at Fernwood, Ill., August 29, and again September 13; the last were seen there October 13. No more congenial home for Rails can be found than the immense marshes in the vicinity of this station. Mr. Lloyd states that one was seen in South Concho, Tex., in the spring of 1886.

211. Rallus longirostris crepitans (Gmelin). [571.] *Clapper Rail.*

An inhabitant of the salt marshes of the Atlantic coast, coming north regularly to Long Island, N. Y. During the first week in June, 1886, Dr. A. K. Fisher found this form breeding commonly at Grand Isle, on the coast of Louisiana, and secured an adult male and two young, which have been examined by Mr. Ridgway and pronounced typical.

211a. Rallus longirostris saturatus Henshaw. [571a.] *Louisiana Clapper Rail.*

A southern form found on the brackish marshes near the Gulf coast of Louisiana (and Texas?).*

212. Rallus virginianus Linn. [572.] *Virginia Rail.*

Winters from the Southern States southward; breeds from northern Illinois northward; known to breed in southeastern Dakota, and in Minnesota and Manitoba. In the spring of 1884 it reached Saint Louis April 1, and by the middle of the month had reached latitude 43° 43′ in Wisconsin.

In the spring of 1885 the following records of 'firsts' were received: Paris, Ill., May 1; Mount Carmel, Mo., May 5; Lanesboro, Minn., May 12; Hennepin, Ill., April 14; Fernwood, Ill., May 10; Milwaukee, Wis., April 23.

In the fall of 1885 the first returning migrants appeared at Fernwood, Ill., September 13, and were last seen September 26.

214. Porzana carolina (Linn.). [574.] *Sora; Carolina Rail.*

Winters over the same area as the last, and also a little further north. It breeds from Kansas northward, and is an abundant summer resident in Manitoba. In southern Illinois it can be found throughout the year. In the spring of 1884 it was seen at Saint Louis April 1, at Laporte City, Iowa, April 16, and at Heron Lake, Minn., April 29. April 26 it arrived at Chicago, and the bulk came to Green Bay, Wis., May 4. The Rails, which ordinarily pass by unobserved, sometimes are suddenly and unexpectedly brought to our notice. For years they had passed to and fro over the city of Winona, Minn., unmolested and unnoticed, but in 1884 an electric light stood in their path and lured them to destruction. On the night of May 21 they were the most numerous of the many birds that were killed or wounded by striking the light-tower. Around the light they could be seen by hundreds.

In the spring of 1885 the Sora Rail was reported from San Antonio, Tex., April 5; Emporia, Kans., April 11; Des Moines, Iowa, April 22; Laporte City, Iowa, May 1; Hennepin, Ill., May 5; Fernwood, Ill., and Heron Lake, Minn., May 10; Minneapolis, Minn., May 11; and Shell River, Manitoba, May 12.

In the fall of 1885 the first migrants were seen at Fernwood, Ill., August 9; Lanesboro, Minn., August 26; Emporia, Kans., September 1; and San Angelo, Tex., September 4. The last was seen at Fernwood, Ill., September 20, and at Saint Louis, Mo., October 5. In western Texas they are rare in spring and abundant in fall (Lloyd).

[*Mr. Ridgway informs me that he inclines to the opinion that this Rail will prove to be a distinct species.—C. H. M.]

215. Porzana noveboracensis (Gmelin). [575.] *Yellow Rail.*

Winters in the Southern States and north to central Illinois; in summer moves up the valley to Minnesota. Has been recorded from Manitoba (Seton). Rather rare everywhere. In 1884 the only record was from Saint Louis, where the first was seen March 18.

In the spring of 1885 the Yellow Rail was seen at Fernwood, Ill., May 9, and was common the next day. It reached Elk River, Minn., May 14. A single specimen was seen at White Earth, Minn., in the latter part of June, but the exact date was mislaid. Specimens were taken at Lawrence, Kans., April 18, and October 1, 1885, by Prof. L. L. Dyche, and it was taken at Emporia, Kans., October 1.

216. Porzana jamaicensis (Gmelin). [576.] *Black Rail.*

Range much the same as that of the preceding, though it does not occur so far north; has been taken in Kansas, southeastern Nebraska, Iowa, and Illinois. In 1884 it was reported as breeding at San Angelo, Tex., from March 9 to June 26.

In 1885 the northward migration of the Black Rail was unnoticed by the observers, but on its return the first was seen at Emporia, Kans., September 26, and at Iowa City, Iowa., the last, October 11.

218. Ionornis martinica (Linn.). [578.] *Purple Gallinule.*

A southern species, occurring throughout the Gulf States and ranging north in summer to Illinois. It has been taken once at Saint Louis, Mo., and was given as a not common species on the Nueces river in Texas.

219. Gallinula galeata (Licht.). [579.] *Florida Gallinule.*

The Florida Gallinule breeds from the Gulf of Mexico to near our northern border. Its winter range includes all of the Southern States, where it is resident; and it occurs, according to Ridgway, up to central Illinois, but Mr. C. W. Butler, of Anna, Ill., says: "I have not found it in winter in fourteen years of collecting in the very places where Mr. Ridgway says it occurs." In its migrations it proceeds northward to Minnesota and Wisconsin in the East, and Kansas and Nebraska in the West. Near Ripon, Wis., it outnumbers the Coot, and its breeding habits until a few years ago could be studied to the best advantage, but persecution has made it wild, and now it hides at the slightest sound. The only record of its arrival in 1884 came from Saint Louis, where it appeared May 11.

In 1885 but one record of the Florida Gallinule was received: its arrival at Des Moines, Iowa, May 26.

221. Fulica americana Gmelin. [580.] *Coot.*

Range in winter the same as that of the Florida Gallinule, but in summer it goes far into British America. It breeds throughout its range, and records of breeding in 1884 were received from various places, all the way from Eagle Pass and San Angelo, Tex., to Ossowa, Manitoba. It must breed early in southern Texas, for Mr. Negley says that at Eagle Pass, March 16, he caught a young Water Hen about two weeks old. At San Angelo Mr. Lloyd did not find young until May 18. In the spring of 1884 migration at Moss Point, Miss., commenced in February, after which no movement was noted until March 24 to March 26, when Coots were recorded simultaneously from Saint Louis, Mo., to Red Wing, Minn. In the West, they were noted from Ellis, Kans., and Alda, Nebr., April 4 and 9, and at the same time at Chicago. The only Wisconsin record was the arrival of the bulk May 4 at Green Bay. May 6 it came to Portage la Prairie, Manitoba, and May 9 it appeared at Oak Point, Manitoba. In the fall of 1884 the first migrants were reported from Emporia, Kans., September 20.

In the spring of 1885 the more regular of the notes contributed on the migration of this species are the following: Fayette, Mo., first seen March 15; Emporia, Kans., March 17; Fernwood, Ill., March 31; Heron Lake, Minn., April 1; Laporte City, Iowa, April 2; Durand, Wis., April 20; Ossowa, Manitoba, May 4.

In the fall of 1885 it arrived at Lanesboro, Minn., September 4, and at Emporia, Kans., September 19. The last was seen at Heron Lake, Minn., November 9.

222. Crymophilus fulicarius (Linn.). [563.] *Red Phalarope.*

Breeds in the far North, coming South in winter to the northern half of the Mississippi Valley. Has been recorded from Illinois (Nelson), and Minnesota (Hatch).

223. Phalaropus lobatus (Linn.). [564.] *Northern Phalarope.*

Breeds in the far North, and is a rare migrant through the Mississippi Valley. It is known from Illinois, Kansas, Minnesota, and Manitoba; and was reported by the observers at Saint Louis, Mo., and Alda, Nebr.

224. Phalaropus tricolor (Vieill.). [565.] *Wilson's Phalarope.*

This is the most common of the three Phalaropes, and it is more abundant in the Mississippi Valley than elsewhere. It does not winter in the Mississippi Valley, but breeds quite commonly in the northern parts and in Manitoba. In 1884 it was reported as breeding in Illinois, Iowa, Minnesota, and Dakota; and it has been known to breed in Nebraska and in western Kansas. May 8 a pair arrived at Vermillion, Dak.; May 17 it was already breeding at Polo, Ill.

In the spring of 1885 it was noted during northward migration at San Angelo, Tex., May 15; at Gainesville, Tex., May 6; Emporia, Kans., April 23; Manhattan, Kans., May 9; and Menoken, Dak., May 12.

In the fall of 1885 the first returned to Emporia, Kans., August 31, and the last was seen at Lanesboro, Minn., September 13. Mr. Lloyd states that in western Texas it is tolerably common in spring, but is not found in fall.

225. Recurvirostra americana Gmelin. [566.] *Avocet.*

During migration the Avocet occurs throughout the Mississippi Valley. East of the Mississippi it breeds from Illinois northward, and in the West even as far south as Mason, Tex., where Mr. Henry found it to be a rare summer resident. Dr. Merrill states that a few pairs remain to breed along the Lower Rio Grande. It winters along the Gulf coast and southward. In migration in 1884 it was seen at Emporia, Kans., May 11, and at Alda, Nebr., May 2. In the fall of 1884 the first Avocet appeared at Emporia, Kans., August 25.

In 1885 no notes were received on its spring migration. In the fall it reached San Angelo, Tex., September 4. In this locality it is a common fall migrant.

226. Himantosus mexicanus (Müll.). [567.] *Black-necked Stilt.*

A common resident along the coast of Texas; in summer distributed locally and rarely over the better watered portions of the Mississippi district. Has been taken in Texas, Illinois, and Minnesota, and was recorded from Kansas by Col. N. S. Goss, on the authority of W. H. Gibson, who saw three in June, 1881, near the Arkansas river, at Lakin, Kans.

228. Philohela minor (Gmel.). [525.] *Woodcock.*

Breeds principally from the middle districts northward, but a few remain in summer throughout the Southern States; rare in Manitoba. It winters wherever it can find unfrozen ground suitable for its wants; hence it is limited principally to the Gulf States during the cold weather, but a few usually spend the winter at Corinth, Miss., and in southern Illinois. Both stations in southern Louisiana report that the number present in winter depends on the weather to the northward. If the winter is severe, they arrive in great numbers, but in mild winters are scarce. In the winter of 1883–'84 they were abundant. By the middle of February almost all had left the State. In the West the Woodcock winters in Kansas, Indian Territory, and occasionally in western Texas. It was reported from San Angelo, Tex., that a few are some times seen there in winter. In the spring of 1884 it reached Chicago March 22, and Portage la Prairie, Manitoba, April 25.

In the fall of 1884, about September 15, I flushed a Woodcock near a small spring in the central portion of Kansas City, Mo. At Mount Carmel, Mo., the last was seen October 23.

In the spring of 1885 it was first seen at Shawneetown, Ill., March 4; Fernwood, Ill., April 1; Lanesboro, Minn., April 21; and Oak Point, Manitoba, May 13. At Shawneetown, Ill., numbers were found in a low, flat bottom along the Ohio river July 25, and a few were seen afterwards. In the fall of 1885 the last were seen at Fernwood, Ill., October 10, and at Shawneetown November 14.

230. Gallinago delicata (Ord). [526^a.] *Wilson's Snipe.*

Breeds chiefly from the Northern States northward; an abundant migrant in the Mississippi Valley; winter range extending to South

America. During the winter of 1883–'84 Wilson's Snipe was not reported from farther north than latitude 33°, but in suitable localities, which, of course, are not common, it remains regularly as far north as southern Illinois, and one case is on record of its wintering in company with Teal and Mallard on the margin of a hot spring in Wyoming. In the winter of 1883–'84 a few were seen at Ellis, Kans., in December, after the creek was newly frozen over. They were late migrants. The great bulk breed in British America, but a few have been known to nest in northern Illinois, and Mr. Lloyd gives it as a resident at San Angelo, Tex., but says he never has found the nest. A few also breed at Heron Lake, in southwestern Minnesota. In western Manitoba it is a common summer resident (Seton).

In the spring of 1884 migration commenced during the latter part of February. February 19 Snipe began to move through Eagle Pass, Tex., where Mr. Negley says they remained one week only. February 29 they had begun to leave southern Louisiana, though the bulk did not leave until the second week in March. They arrived at Caddo, Ind. Ter. (lat. 34° 11′), March 8, and on the 12th and 13th reached Odin, Ill., and Saint Louis, Mo. (lat. 38° 40′). During the rest of March there was no record from Iowa, but in Illinois they were reported up to Chicago. April 5 to 7 they advanced to central Iowa and southern Wisconsin, and by April 15 had reached latitude 44° 45′ in Wisconsin, and latitude 44° 15′ in Dakota, but no record came from Minnesota until the next week. They were recorded from Argusville and Larimore, Dak. (lat. 47° 52′), during the first week in May. This Snipe is not a rapid migrant. The bulk moves about two weeks behind the van, and even in those places where it does not breed it can generally be found from four to six weeks. In the fall of 1884 the first migrating Snipe reached Emporia, Kans., August 30.

In the spring of 1885 it appeared at Corinth, Miss., February 12, and was seen for the second time February 20. It reached Shawneetown, Ill., February 27; Saint Louis, Mo., March 11, and Emporia, Kans., March 14. For the next ten days the cold was too severe for migration, and very little progress seems to have been made in the remainder of the month. During the first five days of April it was noted from Ellsworth, Kans., Fayette, Mo., Des Moines, Iowa; and Paris, Aledo, Hennepin, and Fernwood, Ill. At Hennepin it had also been noticed March 25. It came to Emmetsburgh, Iowa, April 14; Milwaukee, Wis., April 15; Heron Lake, Minn., April 19; Luck, Wis., and Ossowo, Manitoba, May 2; and Shell River, Manitoba, May 4. At Corinth, Miss., the last was seen April 9, and at Mount Carmel, Mo., April 20; while at Bonham, Tex., it did not leave until April 30, and one was taken at San Antonio, Tex., May 27. In the fall of 1885 the last was seen at Heron Lake, Minn., November 14; Fernwood, Ill., November 13; and at Fayette, Mo., November 1. The first migrant appeared at Fernwood, Ill., August 29; at Emporia, Kans., September 3; Saint

Louis, Mo., October 10; and at Bonham, Tex., November 3. The bulk arrived at Saint Louis, Mo., October 16, and the species was still there November 3.

231. Macrorhamphus griseus (Gmelin.) [527.] *Dowitcher; Red-breasted Snipe.*

A bird of eastern North America, breeding far North, and migrating chiefly in the Atlantic region. A few sometimes migrate through the Mississippi Valley, where they have been taken in Illinois. But the common Dowitcher of the Mississippi Valley is the following species, *Macrorhamphus scolopaceus*, under which all the migration records have been placed, though it is impossible to say that none of them belong to the present species.

232. Macrorhampus scolopaceus (Say). [527ª.] *Long-billed Dowitcher.*

Winters from the Gulf coast southward; migrates through the Mississippi Valley, and breeds in British America. Colonel Goss says it is a common migrant in Kansas. But few records of its movements were received. In 1884 its arrival in central Texas was noted March 15, and in southern Minnesota the last of April, while the bulk reached Vermillion, Dak., the first week in May.

In the spring of 1885 the only records received were of its arrival at Paris, Ill., April 5; Mount Carmel, Mo., April 26, and Emporia, Kans., May 1.

233. Micropalama himantopus (Bonap.). [528.] *Stilt Sandpiper.*

Rather a rare bird in the Mississippi Valley, where it occurs during its passage from its winter home to its breeding grounds in the far North. It was not noticed during the spring migration in 1884 or 1885. On its return in 1885 it was shot at Lanesboro, Minn., August 20, and at San Angelo, Tex., September 3. At the latter place it was common during the fall migration.

234. Tringa canutus Linn. [529.] *Knot; Robin Snipe.*

Breeds within the Arctic Circle; in migration abundant along the Atlantic coast, but rare in the Mississippi Valley. Noted from Manitoba, Kansas, Nebraska, and Illinois; and has been taken once by Dr. Hvoslef, at Lanesboro, Minn., this being the first record for that State.

235. Tringa maritima Brünn. [530.] *Purple Sandpiper.*

A northern species, migrating southward in winter, chiefly along the Atlantic coast; found rarely on the Great Lakes. It was killed on Lake Michigan, near Chicago, November 7, 1871. (Nelson, Bull. Essex Inst., Vol. VIII, p. 127.)

239. Tringa maculata Vieill. [534.] *Pectoral Sandpiper; Jack Snipe.*

Breeds in the far North. A common and well-known migrant, from the Gulf of Mexico to Manitoba. In the spring of 1884 it seems to have been overlooked, since it was reported only from Saint Louis, March 17. A "Jack Snipe" was reported from Oak Point, Manitoba, April 22.

In the spring of 1885 the Pectoral Sandpiper was common in the Saint Louis market March 26. At San Angelo, Tex., the first was seen April 27; it was common there the next day, and left May 15. At Emporia, Kans., the first came May 1, and it became common May 4. Dr. Langdon states that in West Baton Rouge parish, La., in the spring of 1881, it was common from March 23 to April 10. (Journ. Cin. Soc. Nat. Hist., Vol. IV, 1881, p. 154.)

240. Tringa fuscicollis Vieill. [536.] *White rumped Sandpiper.*

Breeds in the high North, and occurs in winter from the Gulf of Mexico to southern South America, migrating through the Mississippi Valley. Colonel Goss states that it is a common migrant in Kansas. It has been seen also in Dakota, though rarely, and was noticed at Des Moines, Iowa, March 31, 1884. In Manitoba, large flocks were seen near Shoal lake, June 4, and on Duck mountain, June 8, 1884 (Seton).

In the spring of 1885 the only note contributed on the migration of the White-rumped Sandpiper was the record of its arrival at Emporia, Kans., May 4.

241. Tringa bairdii (Coues). [537.] *Baird's Sandpiper.*

Breeds along the Arctic coast and winters in South America; rather common during migration in Kansas and Nebraska, and has been taken in former years at West DePere, Wis. At Emporia, Kans., it was seen March 27, 1884, and was common March 31. In the fall it reappeared August 25. In the spring of 1885 it was seen at San Angelo, Tex., May 15. At this locality it is a common spring and fall migrant.

242. Tringa minutilla Vieill. [538.] *Least Sandpiper.*

Breeds in the far North and winters from the Gulf of Mexico southward. One of the commonest of its family during its migrations through the Mississippi Valley. Mr. Nehrling says it is not uncommon in winter in eastern Texas, near Houston. In the spring of 1884 it came to Caddo, Ind. Ter., about March 10; passed on to Alda, Nebr., by April 10; and April 25 had appeared at Oak Point, Manitoba, thus averaging more than 25 miles a day.

In the spring of 1885 the record of the northward migration of the Least Sandpiper was regular compared with that of the other shore birds. It appeared at San Angelo, Tex., April 18; at Gainesville, Tex., May 6; Emporia, Kans., May 8; Saint Louis, Mo., May 12; Minneapolis, Minn., May 12, and Huron, Dak., May 13. At San Angelo the last was seen May 16. In the fall of 1885 the first returned to Emporia, Kans., August 6, where it became common August 31. It reached San Angelo, August 25, and was last seen at Saint Louis, Mo., August 31. Dr. Agersborg says he has seen it in southeastern Dakota during the whole summer, but has not found its nest.

243*a*. Tringa alpina pacifica (Coues). [539*a*.] *Red-backed Sandpiper.*

Breeds far north; very rare throughout most of the Mississippi Valley during migration. In the spring of 1884 it was taken at Gainesville, Tex., March 15, and was mentioned as common in Minnesota and Manitoba.

In 1885 the only record of the Red-backed Sandpiper was a note on its appearance at Emmetsburgh, Iowa, April 15.

Dr. Merrill states that near the mouth of the Rio Grande, May 16, 1877, he "found the Red-backed Sandpiper rather common about some lagoons in the salt marshes; the males were in full breeding plumage." (Proc. U. S. Nat. Mus., 1878, p. 161.)

246. Ereunetes pusillus (Linn.). [541.] *Semipalmated Sandpiper.*

A migrant in the Mississippi Valley. In the spring of 1884, it was noticed by two observers only; at Ellis, Kans., it was seen April 5, and at Iowa City, Iowa, May 3.

In the spring of 1885 the Semipalmated Sandpiper was noticed at Gainesville, Tex., May 6; at Emporia, Kans., May 9, and Huron, Dak., May 13. At Emporia the last was seen May 27. A skin of this species was sent me for identification from Bonham, Tex., where it had been taken April 18.

In the fall of 1885 the first came to Lanesboro, Minn., August 21; to Emporia, Kans., August 31. It was last seen at Saint Louis, Mo., August 31.

247. Ereunetes occidentalis Lawr. [541^a.] *Western Sandpiper.*

An inhabitant of the western province of North America; breeding in the far North. Mr. Lloyd states that in Tom Green and Concho counties, Texas, it is "common in spring and fall, arriving in spring, April 10 to May 12; in the fall, from September 4 to October 20."

248. Calidris arenaria (Linn.). [542.] *Sanderling.*

Breeds in the high North; in migration one of the rarest of the family in the Mississippi Valley, but common along the sea-coast. Has been reported from Lawrence, Kans., and from Missouri, Illinois, Minnesota, and Manitoba. In winter and early spring it is common along the coast of Texas (Merrill and Sennett).

249. Limosa fedoa (Linn.). [543.] *Marbled Godwit.*

A common summer resident in Manitoba; also breeds within our border. In June, 1879, it was found breeding abundantly in the Traverse Lake region, in western Minnesota (Roberts and Benner, Bull. N. O. C., Vol. V, 1880, pp. 13, 18). It was reported by Mr. Preston as breeding at Clear Lake, Iowa, and is known to breed in Nebraska, Dakota, and Minnesota (and perhaps also in Texas). It is not known to breed in Kansas. In southeastern Texas it is a spring and fall migrant.

In the spring of 1885 about twenty birds of this species were seen at Huron, Dak., May 3.

251. Limosa hæmastica (Linn.). [545.] *Hudsonian Godwit.*

A migrant in our district; has been noted from a few localities only. Though generally considered a rarer bird than the preceding, Dr.

Agersborg gave it as more common—indeed, as an abundant species during migration in southeastern Dakota. In 1884 the bulk arrived at Vermillion, Dak., May 3. In 1885 a flock of twenty-five was seen at Emporia, Kans., May 8.

254. Totanus melanoleucus (Gmelin). [548.] *Greater Yellow-legs.*

Breeds from the Northern States northward, and occurs in thousands along the Gulf coast in winter. In 1884 migration commenced early in March. March 11 it was seen at Caddo, Ind. Ter.; the next day at Alton, Ill., and during the last week of March it was reported from Manhattan, Kans., and Newton and Laporte City, Iowa. During the first week of April it appeared at Alda, Nebr., and Polo, Ill.; southern Minnesota was reached April 19, and southeastern Dakota two days later. May 4 it was reported from Menoken, Dak., and about May 12 it reached Portage la Prairie, Manitoba. This species was still abundant in southern Louisiana March 12, but left soon after. It has been seldom found breeding in the United States, but has been so noted from northern Illinois, and from Heron Lake, Minn., where it is a common summer resident. In the fall of 1884 the first migrant appeared at Emporia, Kans., October 12.

In the spring of 1885 it appeared at Gainesville, Tex., March 11; Saint Louis, Mo., March 26; Emporia, Kans., March 27; Sioux City, Iowa, April 12; Heron Lake, Minn., April 12; Des Moines, Iowa, April 16; Fernwood, Ill., and Lanesboro, Minn., April 20; and Shell River, Manitoba, April 24.

In the fall of 1885, 'firsts' were noted from Lanesboro, Minn., September 7; Milwaukee, Wis., August 17; Emporia, Kans., August 12; and San Angelo, Tex., September 4. At Lanesboro, Minn., the last was seen October 23.

255. Totanus flavipes (Gmelin). [549.] *Yellow-legs.*

The movements of this species are much the same as those of its larger congener, with which it is often found. Like the Greater Yellow-legs, it is a common summer resident at Heron Lake, Minn., and has been found breeding in northern Illinois. Its times of migration agree very closely with those of the last.

In the fall of 1884 the first flock of Yellow-legs appeared at Emporia, Kans., September 13.

In the spring of 1885 but few notes were received on the movements of this species. It reached Shell River, Manitoba, in company with the Greater Yellow-legs, April 24. In the fall of 1885 the returning flocks were first noted at Emporia, Kans., August 12.

256. Totanus solitarius (Wils.). [550.] *Solitary Sandpiper.*

A common migrant throughout most of the Mississippi Valley; breeds from Illinois northward, and probably also in Kansas and Nebraska. In 1884 it appeared at Gainesville, Tex., March 14; and at Des Moines, Iowa, April 26. At Saint Louis, Mo., the first record was May 5 and the last May 22.

In the spring of 1885 no records were received of the movements of the Solitary Sandpiper from any point south of Emporia, Kans., where it arrived April 23. The next day it was seen at Saint Louis, Mo., and Aledo, Ill.; May 2 at Manhattan, Kans.; May 3 at Huron, Dak.; May 4 at Des Moines, Iowa, and May 9 at Lanesboro, Minn. At Saint Louis, Mo., the last was noted May 12.

In the fall of 1885, it was seen for the last time at Fernwood, Ill., September 26, and at Saint Louis, Mo., September 25. It had appeared at San Angelo, Tex., September 7. Dr. Agersborg says it is very rare in southeastern Dakota. Mr. Lloyd says that in western Texas it is tolerably common in September, but rare in spring.

Symphemia semipalmata inornata Brewster. [552 in part.] *Western Willet.*

Breeds from the Gulf States northward. Occurs during migration throughout the Mississippi Valley, and, unlike the previously mentioned members of the family, does not proceed far northward. Near Houston, in eastern Texas, it is a common resident (Nehrling). It breeds throughout Illinois, and Mr. Preston reported it as a rare breeder near Newton, Iowa. In Kansas and southern Dakota it was marked as a rare migrant in the spring of 1884, the bulk arriving at the latter place May 3. In northern Dakota and western and northwestern Minnesota it breeds abundantly. It was seen at Chicago, Ill., May 13, though of course this record must not be considered that of first arrival.

In the spring of 1885 but two records were received of the movements of the Willet. It arrived at Emporia, Kans., May 2, and at Heron Lake, Minn., May 10. (For the description of this recently separated subspecies, see the Auk, Vol. IV, No. 2, April, 1887, pp. 145–147).

261. Bartramia longicauda (Bechst.). [555.] *Bartramian Sandpiper; Field Plover.*

The Upland Plover is common throughout our district, and breeds from Kansas and Illinois northward. Usually it is thought not to winter in the United States, but Mr. Lloyd shot one at San Angelo, Tex., in January, 1883. In the spring of 1884 migration commenced early in March, and the van reached Saint Louis March 17. March 25 and 26 it was reported from Ellis, Kans., Storm Lake, Iowa, and Tampico, Ill. There was evidently a halt called when the storms of April commenced, and no further advance occurred until April 14, with the exception of some stragglers at Linwood, Nebr. On that day and the next it appeared at Polo, Ill., Laporte City, Iowa, and Unadilla, Nebr. During the rest of April it passed on to latitude 45° in Minnesota, and to Vermillion, Dak., latitude 42° 56. Upland Plover were seen at Barton and Huron, Dak., May 4 and 5; at Argusville, Dak. (lat. 47° 8′), May 10; and at Menoken, Dak. (latitude 46° 58′), May 1; these last must have been stragglers. At Red Rock, Ind. Ter., they were constantly seen and heard all summer, so that although no nests were found they may be put down as summer residents in the Territory. During the spring thousands passed over, reminding one strongly of the great flocks of Passenger Pigeons seen in Wisconsin and Minnesota.

In the fall of 1884 the first Field Plover appeared at Abbeville, La., August 1, where the species became common August 4.

In the spring of 1885 the migration was about two weeks later than in 1884. The first appeared at Abbeville, La., March 20; at Bonham and Gainesville, Tex., March 28; at Saint Louis, Mo., and Odin, Ill., April 2; Hennepin, Ill., April 5; Emporia, Kans., April 7; and from April 10 to 15 at Manhattan, Kans., Unadilla and Linwood, Nebr., Grand View, Dak., Newton, Grinnell, and Emmetsburgh, Iowa, and Aledo, Ill. From April 20 to 23 it was seen at Stoughton, Lake Mills, and Leeds Centre, Wis.; April 27, at Huron, Dak. (two observers); April 28 at Heron Lake, Minn., and May 4 at Menoken, Dak., and Shell River, Manitoba.

In fall migration in 1885 it was very common at San Angelo, Tex., July 7, and was last seen at Bonham, Tex., September 2.

262. **Tryngites subruficollis** (Vieill.). [556.] *Buff-breasted Sandpiper.*

A rather rare and very irregular migrant in the Mississippi Valley. Dr. Agersborg states that it is an abundant spring migrant in southeastern Dakota; and Dr. A. K. Fisher tells me that in August, 1874, he saw hundreds of Buff-breasted Sandpipers on the dry prairie at Maywood, Cook county, Ill., only 10 miles from Chicago, and that he shot numbers of them.

In the spring of 1884 a flock was seen at Gainesville, Tex., May 5. (For additional remarks on its occurrence in Texas see Bull. Nutt. Ornith. Club, Vol. VI, 1881, pp. 61, 62.)

263. **Actitis macularia** (Linn.). [557.] *Spotted Sandpiper.*

An abundant migrant in most parts of the Mississippi Valley. Breeds commonly in Manitoba, and many stop to breed all along their course, after wintering in the southern States. April 23 and April 26 it appeared at Manhattan, Kans., and Saint Louis, Mo. The next two days it was found in southern Minnesota and northern Illinois. At Alda, Nebr., it arrived May 2, and at Portage la Prairie, Manitoba, May 5.

In the fall of 1884 the last Spotted Sandpiper left Des Moines, Iowa, September 17.

In the spring of 1885 the notes were very irregular. The first was seen at San Angelo, Tex., March 9; at Paris, Ill., and Lanesboro, Minn., April 23; Des Moines, Iowa, April 24; Manhattan, Kans., and Iowa City, Iowa, May 2; and Minneapolis, Minn., May 11.

In the fall of 1885 the last was seen at Lanesboro, Minn., October 22.

264. **Numenius longirostris** Wils. [558.] *Long-billed Curlew.*

Occurs over the whole of the Mississippi Valley, and is known to breed throughout most of its range. It winters in the southern States, where it is resident, and occasionally is found in winter in southern Illinois. Colonel Goss states that in Kansas it is a rare summer resident, but a common migrant. Mr. Lloyd says that in Texas it winters in Concho county, but not in Tom Green county. It migrates early, and March 11, 1884, at Darlington, Ind. Ter., hundreds were seen in three flocks. For a few days it flew east and northeast at night, and in the opposite direction in the morning. April 3 it reached Alda, Nebr., and two days later Vermillion, Dak.; April 16 it reached Argusville, Dak., and April 24 Menoken, Dak. By May 4 it had come to Larimore, Dak.; and May 9 was reported from Oak Point, Manitoba. It passed Saint Louis April 1, and through central Iowa April 15.

During the winter of 1884–'85 the Long-billed Curlew remained at Eagle Pass, Tex., where it was seen January 7 and February 9.

In the spring migration of 1885, from April 10 to April 15, it was noted at Emporia, Kans.; Emmetsburgh, Iowa; Heron Lake, Minn.; Grand View, Dak., and Huron, Dak. It reached Larimore, Dak., April 26. In the fall of 1885, the returning flocks appeared at Emporia, Kans., August 5, and at San Angelo, Tex., August 20. At Fernwood, Ill., the last were seen October 13.

265. **Numenius hudsonicus** Lath. [559.] *Hudsonian Curlew.*

A common migrant in most parts of the Mississippi Valley, wintering in the Southern States. Rare in Kansas (Goss). It does not breed within our limits. The only record received came from Heron Lake, Minn., May 1, 1884.

266. **Numenius borealis** (Forst.). [560.] *Eskimo Curlew.*

The most abundant of the three Curlews. Migrates through the Mississippi Valley in immense numbers, but does not stay to breed or to winter. In the spring of 1884 the first came to Saint Louis, Mo., and to Caddo, Ind. Ter., March 25, and the prairies were fairly alive with them at Caddo, April 2. On the same day they were noted from Wise county, Tex., and Alda, Nebr. April 3 found a few at Heron Lake, Minn., and the bulk arrived at Vermillion, Dak., May 3.

In the spring of 1885 the first Eskimo Curlew appeared at Gainesville, Tex., March 7; one was found in the Saint Louis market April 6; they reached Emporia, Kans., April 13, and Heron Lake, Minn., April 24.

270. **Charadrius squatarola** (Linn.). [513.] *Black-bellied Plover.*

This species is more numerous along the coast of the United States than it is in the interior, but it has been found throughout the Mississippi Valley and in Manitoba during its migrations. It breeds in the far North. In most of the State lists it is marked rare, but we have several records of its occurrence in anything but small numbers. The most interesting came from Alda, Nebr., whence Mr. Powell writes: "In southeastern Nebraska it is usually rare, but May 21, 1883, I saw thousands of them on the Platte river. The weather had been rainy for a few days before I saw them, with the wind from the south, but on that day the wind blew stiff from the north, with broken clouds flying, and the air pretty cold. The birds were on the hay-flats on the south side of the river. I drove up the valley seven or eight miles, and was not out of sight of large flocks any of the time. They were wild and I killed only three."

In the spring of 1884 there was no regularity in the notes on this species, and probably the fault was in the birds. At Polo, Ill., the first was seen April 30, and the day before at Heron Lake, Minn., they were found in flocks which stayed about two weeks. At Alda, Nebr., a good many passed over during the nights of April 25 and 27. On April 16, flocks of thousands were seen at Argusville, Dak., and the bulk was given as arriving at Vermillion, Dak., May 5.

In the spring of 1885 the first Black-bellied Plover was seen at Hennepin, Ill., April 2; at Heron Lake, Minn., April 24; and at Huron, Dak., May 5. The last at Hennepin, Ill., was seen May 3.

272. Charadrius dominicus Müll. [515.] *Golden Plover.*

Breeds in the Arctic regions, and occurs in migration throughout the Mississippi Valley and Manitoba. In the spring of 1884, at Caddo, Ind. Ter., the first came about March 11; between March 21 and 27, it was noted from latitude 39° in Missouri to latitude 41° 42′ in Iowa, and to Chicago, Ill. Then no more records were made until after the April storms. About April 16, it began to move again, and April 24 it was reported from Unadilla, Nebr., and Leeds Centre, Wis.; April 29 it reached Heron Lake, Minn., and the first week in May was reported from Argusville and Larimore, Dak. In southeastern Dakota it is very abundant during migration.

In the fall of 1884 the first Golden Plover was seen at Emporia, Kans., October 22; and at San Angelo, Tex., where it was reported as a winter visitant, flocks of hundreds were seen in November.

In the spring of 1885 the van reached Gainesville, Tex., March 17. They were found in the Saint Louis market March 26, and the same day were seen at Odin, Ill., and Richmond, Kans. At Hennepin, Ill., a flock was seen March 31. They came to Des Moines, Iowa, April 16; Fernwood, Ill., April 25; Heron Lake, Minn., and Argusville, Dak., May 4. The last at Richmond, Kans., was seen May 8.

In the fall of 1885 the first was noted from Fernwood, Ill., July 15; no more until August 3; common August 20; disappeared October 12.

Dr. F. W. Langdon states that in West Baton Rouge parish, La., in the spring of 1881, Golden Plover "frequented the pastures and stubble-fields from April 2 to 15, in flocks numbering from a dozen to twenty individuals." (Jour. Cin. Soc. Nat. Hist., Vol. IV, 1881, p. 154.)

273. Ægialitis vocifera (Linn.) [516.] *Killdeer.*

Breeds throughout the Mississippi Valley and Manitoba; an abundant winter resident along the coast, and for 100 miles inland; less common north to latitude 35°; and only occasional up to southern Illinois. In Texas it does not ordinarily winter north of latitude 33°. This is the first plover to move northward, usually keeping but a few days behind the Ducks, Blackbirds, and Robins. In the spring of 1884 Killdeer commenced their journey as usual in the latter part of February, but did not make much progress during that month. A single one was seen at Caddo, Ind. Ter., February 22, but it was a week later before the general advance began. At San Angelo, Tex., Mr. Lloyd's report states: "Although many stay here all winter, they have been arriving in great numbers since March 1, and will breed in a week or so." Fresh eggs were found at Eagle Pass, Tex., March 18, and at San Angelo from March 9 to June 24. This wave of March 1 reached Gainesville, Tex., and Caddo, Ind. Ter., March 5 and 6, making the species quite common; but the bulk did not arrive until March 11, by which time the first had traveled to Saint Louis, Mo.; Odin, Ill.; Ellis, Kans.; and Manhattan, Kans. Here then we have the van of migration stretching in an almost straight line due east and west for 700 miles. The northern limit of the area over which the Kildeer wintered is a line curving southward as it passes to the west, but the first spring wave started earlier in the West than near the Mississippi, and by March 11 they were even all along the line. From here the advance in Illinois took place March 13, and a corresponding advance in Iowa March 16 to latitude 42°. March 23 and 24 there was an advance all along the line to latitude 43° 47′ in eastern Wisconsin; to latitude 45° in Minnesota and western Wisconsin near the Mississippi; to latitude 43° 48′ in western Minnesota, and up the Missouri river to latitude 42° 56′ in Dakota. Continuing northward in the West, they were observed at latitude 44° 21′ in Dakota on March 27, and April 14, had passed on up the Missouri to Menoken, Dak., latitude 46° 58′. April 23 they were at Portage la Prairie, Manitoba.

In the fall of 1884 the last Kildeer left Des Moines, Iowa, August 15. At Mount Carmel, Mo., the first migrant was seen August 30, and the last October 1.

In the spring of 1885 the record began with two irregular occurrences: February 28 it was reported from Richmond, Kans., and Odin, Ill. The regular advance was as follows: Corinth, Miss., March 1; Saint Louis, Mo., and Ellsworth, Kans., March 2; Shawneetown, Ill., March 4; Paris, Ill., March 5; Glasgow, Mo., March 10; Unadilla, Nebr., March 11; Ferry, Iowa, March 12. And on March 14 it appeared at Des Moines, Laporte City (two observers) and Newton, Iowa, and at Tampico (two observers) and Hennepin, Ill. From March 25 to 26 a slight advance was made to Batavia, Ill., Delavan, Wis., and Emmetsburgh, Iowa. March 31 and April 1 the Kildeer, with thousands of other birds, made a long journey, appearing at Clinton, Milwaukee, Lake Mills, Leeds Centre, New Cassel, and New Richmond, Wis.; Heron Lake, Minn., and Huron, Dak. (two observers). It was reported April 4 at Argusville, Dak., and April 17 at Oak Point, Manitoba.

In the fall of 1885 the last was seen at River Falls, Wis., September 29; at Fernwood, Ill., September 10; at Grinnell, Iowa, October 17; and at Iowa City, Iowa, October 24. The first migrant reached Bonham, Tex., November 3; the next, November 4, and it had become common by the 11th.

274. Ægialitis semipalmata Bonap. [517.] *Semipalmated Plover.*

Winters from the Gulf coast and Texas southward, and passes up the Mississippi Valley during April and May, to breed in the far North.

No dates of its migration were given in 1884.

In the spring of 1885 the only note on the northward migration of the Semipalmated Plover was that of its arrival at Emporia, Kans., April 25, at which place it was common April 30. On its return it was noted at Huron, Dak., September 1, and at Lanesboro, Minn., September 3.

277a. Ægialitis meloda circumcincta Ridgw. [520*a*.] *Belted Piping Plover.*

This is the form of the Piping Plover which inhabits the Mississippi Valley, wintering south of our border, and breeding abundantly from northern Illinois and Nebraska northward to Lake Winnipeg. It is not yet known from Kansas. It was reported as breeding at Grinnell, Iowa, but was not noted during migration.

278. Ægialitis nivosa Cass. [521.] *Snowy Plover.*

A bird of the western province of North America, recently added to our district by Col. N. S. Goss, who, in June, 1886, found it breeding plentifully on the salt plains along the Cimarron river in Indian Territory and southern Kansas. Still more recently, Mr. Sennett has procured it from southern Texas.

280. Ægialitis wilsonia (Ord). [522.] *Wilson's Plover.*

A southern species, breeding along the South Atlantic and Gulf coasts; abundant along the coasts of Texas and Louisiana. Not known from the interior.

281. Ægialitis montana (Towns.). [523.] *Mountain Plover.*

Inhabits the western portion of our district from western Texas to western Dakota; breeds from Kansas northward. Mr. Lloyd says that at San Angelo, Tex., it is common in spring and fall, and that some remain through the winter. Mr. Brown took it at Boerne, Tex. At Ellis, Kans., it is a regular summer resident and is common.

283. Arenaria interpres (Linn.). [509.] *Turnstone.*

A bird of wide distribution. Breeds along the coast of Texas. Its home is on the sea-coast, but it sometimes wanders into the interior, and has been taken in Manitoba, Minnesota, and along Lake Michigan. It was reported as an accidental visitant at West De Pere, Wis.

286. Hæmatopus palliatus Temm. [507.] *Oyster-catcher.*

Breeds plentifully along the Gulf coast, whence reported from Texas. It is stated that the Oyster-catcher was always observed flying in pairs, and that not more than two were ever seen together.

288. Jacana gymnostoma (Wagl.). [568.] *Mexican Jaçana.*

A southern species, coming north to the valley of the Rio Grande, in Texas (Merrill).

289. Colinus virginianus (Linn.). [480.] *Bob-white; Quail.*

Resident over all of the Mississippi Valley, except in the extreme west and northwest. In Minnesota it has followed up the settlements, and in the eastern part of the State has reached the line of the Northern Pacific Railroad, about latitude 46°. At latitude 47° I neither saw it nor heard of it. In southeastern Dakota it is abundant and has advanced to about latitude 44° 30′. Northwestern Minnesota and most of Dakota are yet to be occupied by this species.

The question is often asked whether the habit Quail have of "lying to a dog" is natural or acquired. To get a satisfactory answer one has only to hunt in different parts of Indian Territory. In the region west of Fort Sill the Quail never think of stopping when they see a dog, but run as fast as possible, and upon his near approach they flush immediately, just as we may suppose they do on the approach of a coyote. In the eastern part of the Territory, near the railroad, the Quail lie quite well to a dog, and as they are exceedingly abundant, excellent sport may be had from November to March.

289b. Colinus virginianus texanus (Lawr.). [480*b*.] *Texas Bob-white; Texas Quail.*

This is the form which inhabits Texas, where all the stations reported it as resident and common. Its range extends northward to western Kansas.

Mr. Atwater writes from San Antonio, Tex.: "These Quails often come close to the ranch and lay eggs in hens' nests—I suppose on account of the protection thus afforded against snakes. I have hardly ever found nests of any kind of bird on the ground. Lark Finches always build in trees in this locality. These facts I explain on the snake theory." Mr. Lloyd found nests at San Angelo, Tex., May 12 and 14, 1882. These Quails raise two broods a year, nests having been found in 1883 as late as August 18. Clutches of 12, 13, 14, 15, 14, and 12 eggs have been taken.

293. Callipepla squamata (Vig.). [484.] *Scaled Partridge; Blue Quail.*

Like the last, the Blue Quail is resident in western Texas. It was reported as rare at Eagle Pass, and common at San Angelo and Mason. Mr. Henry says it is common for 75 miles north and west of Mason, Tex. Mr. Lloyd gives the following information concerning its range: "The habitat of this bird runs east [of San Angelo] about 30 miles. I shot both male and female last May near the mouth of the [Concho] river, and on inquiry found they were the first ever seen beyond the above limit. The northeastern boundary of their range I believe is Runnels and Taylor counties, near Abilene, on the Texas and Pacific Railroad."

In 1882 Mr. Lloyd took a nest with 13 eggs at San Angelo, Tex., April 26, and another, containing 6 eggs, May 13. In 1884 a nest with 12 eggs was taken May 7.

Two specimens were shot at Bonham, Tex., latitude 33° 34′, in December, 1885, from a covey of about a dozen. The species had never been seen before in that vicinity.

293a. Callipepla squamata castanogastris Brewst. [—]. *Chestnut-bellied Scaled Partridge.*

This beautiful Quail inhabits eastern Mexico and the Lower Rio Grande valley in Texas. The eastern limit of its range is defined by the foothills of the Rio Grande, about 100 miles from the coast, below which it is a rare straggler (Sennett).

295. Callipepla gambeli (Nuttall). [483.] *Gambel's Quail.*

An inhabitant of northwestern Mexico and contiguous portions of the United States; resident in western Texas.

296. Cyrtonyx montezumæ (Vig.). [485.] *Massena Partridge; Massena Quail.*

This species is found from western Texas westward and southwestward. Mr. Henry recorded it as a rare resident at Mason, and Mr. Lloyd says it is resident in Tom Green county, 20 miles west of San Angelo.

297. Dendragapus obscurus (Say). [471.] *Dusky Grouse.*

A Rocky mountain species, recorded from the Black Hills.

298. Dendragapus canadensis (Linn.). [472.] *Canada Grouse; Spruce Partridge.*

Principally resident in British America, but in winter occurs as far south as Racine, Wis. In Minnesota it is resident from Minneapolis northward, becoming quite common in the immense forests of the northeastern part of the State, and extending westward to the edge of the prairie at White Earth.

300. Bonasa umbellus (Linn.). [473.] *Ruffed Grouse.*

Resident over all the Mississippi Valley except the southwestern quarter. In Nebraska it has been seen in the southeastern portion only, and though formerly known as a resident in eastern Kansas, is not now known to occur in the State. It is still reported from Missouri, and is common in Iowa. It is very scarce in northwestern Arkansas and is said not to occur in Louisiana, as it certainly does not in Indian Territory and Texas.

300a. Bonasa umbellus togata (Linn.). [— .] *Canadian Ruffed Grouse.*

This sub-species is the form inhabiting the dense evergreen forests of northern Maine and the British Provinces. It occurs as far west as eastern Oregon and Washington Territory. Specimens collected by Mr. Ernest E. Thompson have been sent from Manitoba and Lake of the Woods to Mr. Ridgway, who pronounces them typical *togata*.

300b. Bonasa umbellus umbelloides (Dougl.). [473*a*.] *Gray Ruffed Grouse.*

This is a bird of the Rocky Mountain region and western British America. Mr. Ridgway has examined specimens of it collected near Carberry, in western Manitoba, by Mr. Ernest E. Thompson.

301. Lagopus lagopus (Linn.). [474.] *Willow Ptarmigan.*

The Willow Grouse has been exterminated or driven away from most of its range in the United States. Formerly it visited northern Illinois in winter, but is not known to do so now. A few are still found in Minnesota, where it is so rare that the Indians have no name for it. The Willow Grouse was noted during the winter of 1883–1884 at Portage la Prairie, Manitoba, by Mr. Nash, who states that it visits Lake Manitoba every winter.

305. Tympanuchus americanus (Reich.). [477.] *Prairie Hen; Pinnated Grouse.*

The Prairie Hen is common on the prairies of the Mississippi Valley from southeastern Texas and Louisiana northward as far as our boundary, which it reached in 1881. In 1883 it began to be common at Pembina. In 1884 it became common at Winnipeg, Manitoba, and appeared in large numbers at Portage la Prairie, on the Assiniboine River (latitude 50°).* It has been gradually spreading westward, and previous to the great extension of the railroad it kept just about abreast of the settlements. Dr. Coues, writing in 1874, said that it then inhabited the eastern half of Minnesota, but he had no reason to believe that it occurred at all in northwestern Minnesota or northern Dakota. In June, 1879, Roberts and Benner saw several at Herman, Minn., 40 miles from the Dakota line.† In 1880 I found it abundant in northwestern Minnesota up to latitude 47° and only 40 miles from the Dakota line. I also heard that it was then not uncommon across the Red river, at Grand Forks, Dak. Now it has occupied the whole length of eastern Dakota, covering a strip from 30 to 60 miles in width. At the same time it has spread from middle to western Kansas, and from eastern Texas to Colman county, a little west of the middle of the State. Mr. Nehrling says of it in southeastern Texas near Houston: "Common resident on all the flat, grassy prairies. Is becoming scarcer every year." (Bull. Nut. Ornith. Club, Vol. VII, 1882, p. 175.) In Indian Territory it is found as far west at least as the middle of the State.

The following letter from Mr. C. W. Nash, of Portage la Prairie, Manitoba (latitude 50°), gives an interesting account of the invasion of that locality by this species:

> The first information I received of the appearance of the Pinnated Grouse in this Province was from a farmer living about 8 miles north of this town (Portage la Prairie), who had shot one in the fall of 1882. I did not see the bird, but from the description he gave me of it I could not mistake it. I immediately made inquiries among the hunters of this locality, but no one else had seen it. In the fall of 1883 I again heard of the bird in one or two places, but saw none myself. In the fall of 1884 it

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* Ernest E. Thompson in The Auk, Vol. III, 1886, p. 153.

† Bull. Nutt. Ornith. Club, Vol. V, 1880, p. 18.

became plentiful, comparatively speaking, in this neighborhood and to the eastward, that is to say, between here and Winnipeg. I had the good fortune to secure two specimens in rather a lucky fashion. I was out with a friend, chicken shooting, October 6, 1884, at Burnside, a settlement 10 miles west of this town, when we saw a large flock of Grouse alight in a stubble field near us. When we reached the field three birds got up, of which I killed two with the first barrel, and the other with the second barrel. Of the two first killed, one was a Pinnated Grouse, and the other a Sharp-tailed Grouse; the one killed with the second barrel was a Pinnated Grouse. I got no others, but heard of them from nearly all of my acquaintances who hunt. Strange to say, all that were obtained, except one, appear to have been young birds, and this one was in full plumage, having on each side of the neck the long, pointed feathers peculiar to the species. So far as I can learn with any degree of certainty, these birds are not yet (March, 1885) found much west of the place where I killed mine, nor farther north than 10 or 12 miles from Portage la Prairie. They are evidently working in here from Minnesota and Dakota, and are following the grain. Up to this time the Sharp-tailed Grouse has been very abundant, but, as might be expected, it is getting scarcer in the vicinity of the towns. So far, both birds here associate together when they pack and find food in the stubbles.

We have here a case of northward migration of young birds in the fall, similar to that which has been noticed so often in the case of the Herons.

At Portage la Prairie none were seen in spring until 1885, when a few were noticed and its "booming" was heard for the first time.

The Prairie Chicken is commonly said to be a resident bird, and so it is in the larger part of its range; but in Iowa a regular though local migration takes place. This has been mentioned by former writers, and in the spring of 1884 a special study was made of the matter. Many observers unite in testifying to the facts in the case, and, what is still more important, there is not a dissenting voice. One of the observers does not exaggerate when he says: "Prairie Chickens migrate as regularly as the Canada Goose." Summing up all the information received, the facts of the case are as follows: In November and December large flocks of Prairie Chickens come from northern Iowa and southern Minnesota, to settle for the winter in northern Missouri and southern Iowa. This migration varies in bulk with the severity of the winter.

During an early cold snap immense flocks come from the northern prairies to southern Iowa, while in mild, open winters the migration is much less pronounced. During a cold, wet spring the northward movement in March and April is largely arrested on the arrival of the flocks in northern Iowa; but an early spring, with fair weather, finds them abundant in the southern tier of counties in Minnesota, and many flocks pass still farther north. The most remarkable feature of this movement is found in the *sex* of the migrants. It is the females that migrate, leaving the males to brave the winter's cold. Mr. Miller, of Heron Lake, Minn., fairly states the case when he says: "The females in this latitude migrate south in the fall and come back in the spring about one or two days after the first Ducks, and they keep coming in flocks of from ten to thirty for about three days, all flying north. The Grouse that stay all winter are males."

In the spring of 1884, at Iowa City, Iowa, the first flocks passed over March 10, and the bulk March 22; at Newton, Iowa, the bulk was noted March 23. The "booming" of the species was recorded from March 7, at Caddo, Ind. Ter., to March 24, at Barton, Dak. In the spring of 1885, the commencement of "booming" was noted at Richmond, Kans., March 1, and at Argusville, Dak., March 27. At Newton, Iowa, the northward movement was very pronounced March 11.

Early nesting was reported at Durand, Wis., March 28; while at Vermillion, Dak., in 1884, a nest with sixteen fresh eggs was found as late as June 9.

In the fall of 1885, at Des Moines, Iowa, Pinnated Grouse were moving south in large numbers October 17.

307. Tympanuchus pallidicinctus (Ridgw.). [477*a*.] *Lesser Prairie Hen.*

This Prairie Hen inhabits the eastern border of the Great Plains, from southwestern Kansas to western Texas. Colonel Goss records it as "resident in southern Kansas; rare." In Texas Mr. Lloyd states that it is a winter visitor. He says:

> Seen in October and November in Concho county, and also in winter on Middle Concho, in Tom Green county. Abundant near Colorado City, on the Texas and Pacific Railroad. I believe this record extends the range to the southwest. Westward it was abundant to the foot-hills of the Davis mountains. Said to have been driven from the Pan Handle counties by the numerous prairie fires. (The Auk, Vol. IV, 1887, p. 187.)

308. Pediocætes phasianellus (Linn.). [478.] *Northern Sharp-tailed Grouse.*

The typical form is a British-American bird, reaching the United States only along our northern boundary. It is resident in Manitoba, and was reported as common at Portage la Prairie. Specimens sent to Mr. Ridgway from western Manitoba by Mr. E. E. Thompson are intermediate between true *phasianellus* and *phasianellus campestris.*

308b. Pediocætes phasianellus campestris Ridgw. [—.] *Prairie or Common Sharp-tailed Grouse.*

The home of the Prairie Sharp-tailed Grouse is on the plains and prairies of the United States east of the Rocky mountains and south to New Mexico. Dr. Agersborg states that at Vermillion, Dak., it "is getting rarer every year." I am indebted to Mr. Carr, of Waupaca, Wis., for the boundaries of its range in that State. He writes:

> Sharp-tailed Grouse are quite abundant on Sisson's prairie, Portage county, in the fall of the year, but as soon as cold weather sets in they keep in the edge of the woods. They are associated with the Prairie Hen (*Tympanuchus americanus*). They range in the northwestern portion of the State, from about the center of Waushara county, but are found most abundant in Waushara, Waupaca, Portage, Shawano, and Marathon counties, though there are not many in the two latter.

Colonel Goss says they are still resident in middle and western Kansas, but are becoming rare; while Dr. Watson says that in the vicinity of Ellis, Kans., they disappeared in 1875 and since then the Prairie Hen (*T. americanus*) has taken their place. Even in Illinois a few are still found, according to Mr. Ridgway, on the prairies of the northern part of the State, but are very scarce. They were recorded as rare residents at Grinnell, Iowa. In Grant and Traverse counties, in western Minnesota, they are "the common Grouse of the region." (Roberts and Benner, Bull. Nutt. Ornith. Club, Vol. V, 1880, p. 17.)

309. Centrocercus urophasianus (Bonap.). [479.] *Sage Grouse; Sage Cock.*

In the Mississippi Valley district the Sage Cock is found only along the extreme western edge of Kansas, Nebraska, and Dakota. Colonel Goss gives it as resident in western Kansas, and cites Mr. Cavanaugh as having often killed it among the sage brush in the southwestern corner of the State. The Colonel does not state whether or not there is any other record of the occurrence of the species in the State. This record has been called in question by Dr. Watson, of Ellis, Kans., who says there is not, and never has been, any sage brush in the southwestern part of the State, and hence no Sage Cock. He suggests that the bird Mr. Cavanaugh saw was the Chaparral Cock (*Geococcyx californianus*). There is no reason to doubt the other records.

310. Meleagris gallopavo Linn. [470*a*.] *Wild Turkey.*

Occurs locally throughout the Mississippi Valley, south to eastern Texas, and west to the plains; resident wherever found. The range of this "the noblest of American game-birds" has been gradually contracted by its extermination in the settled parts of the country. In 1874 Dr. Coues gave its northern limit as not far from the southern boundary of Minnesota. Dr. Agersborg states that it is resident, though not common, in southeastern Dakota. In 1881 it was common in Knox county, Ind. (Ridgway). It is still reported from Nebraska, Kansas, and Illinois, growing more abundant to the southward until in Indian Territory it is no longer uncommon. That it is abundant around Red Rock, Indian Territory, I can testify from personal experience. Here it rivals the Prairie Hen in numbers, and lying well to a dog affords splendid sport. In the winter of 1883–'84 flocks were seen which were variously estimated as comprising from two hundred to five hundred individuals. In the southern part of the Territory I have seen the bottom of a lumber wagon piled up with the results of a single night's sport. If one wants Turkey hunting let him come to Indian Territory from December 1 to the middle of January.

310*a*. Meleagris gallopavo mexicana (Gould). [470.] *Mexican Turkey.*

This, the original ancestor of the domesticated Turkey, inhabits the table-lands of Mexico, western Texas, and Arizona. Specimens referred to this form were taken by Mr. Atwater at San Antonio, Tex., where the species is resident; its eggs also were secured. Mr. Lloyd says of it in western Texas:

> Resident. Once very abundant on every creek, but now rarely to be met with. I flushed a hen from her nest—a depression in a patch of low bushes—May 29, 1882, con-

taining eight eggs; but I have frequently heard of them further south with ten to fourteen eggs. Another brood was raised on a small rushy island in Brady creek, in the eastern part of Concho county, the young running about June 1, 1883. (The Auk, Vol. IV, 1887, p. 187.)

311. Ortalis vetula maccalli Baird. [469.] *Chachalaca.*

The Chachalaca is an inhabitant of northeastern Mexico and the valley of the Lower Rio Grande in Texas, where it is abundant.

313. Columba flavirostris Wagl. [457.] *Red-billed Pigeon.*

This large Pigeon inhabits Mexico and Central America, coming north in summer to the Lower Rio Grande valley in Texas, where it breeds plentifully.

315. Ectopistes migratorius (Linn.). [459.] *Passenger Pigeon.*

The Pigeon is irregular in all its movements, wandering both in winter and summer in search of sufficient food to satisfy the hunger of its immense hordes. Mr. Lloyd tells us that the Nueces cañon, in southwestern Texas, is the winter home of countless myriads of Pigeons, but for the most part it is not a common species in the West. It winters usually from latitude 37° and always from latitude 36° southward, though I am confident that not a bird wintered within 20 miles of Caddo, Ind. Ter., in the winter of 1883-'84, and most of the local gunners claim that it never occurs in that part of the Territory. I never saw it there either in fall, winter, or spring.

In the spring of 1884 its northward journey commenced about the middle of March, and by March 16, stations here and there had noticed it up to latitude 42°. It was found about the forty-fourth parallel March 23, and reached Elk River, Minn. (latitude 45° 25′), March 29. The storms of April evidently delayed its progress, as it was not reported from Barton, Dak., until May 4, and did not reach Oak Point, Manitoba, until May 20. The bulk was reported from Portage la Prairie, Manitoba, May 12, a few having been seen previously. On May 21 fresh eggs were found.

In the fall of 1884 the bulk of Passenger Pigeons departed from Williamstown, Iowa, September 15, and the last was seen there September 27. At Mount Carmel, Mo., the first migrant was seen September 9, and the last September 21.

In the spring of 1885 the northward movement began somewhat later than in 1884. The only records made previous to April 1 were: Hennepin, Ill., March 26, and Milwaukee, Wis., March 31. During the first half of April migration was rapid though irregular, and April 18 the first arrived at Ossowo, Manitoba. In the fall of 1885 the first appeared at Saint Louis, Mo., September 19; Mount Carmel, Mo., September 27; and at Shawneetown, Ill., October 3. The last at Elk River, Minn., was recorded September 26, and at Mount Carmel, September 30.

This Pigeon is a common summer resident in Manitoba (Seton).

316. Zenaidura macroura (Linn.). [460.] *Mourning Dove; Carolina Dove.*

A common breeder throughout the Mississippi Valley. From latitude 36° southward this Dove can be found regularly and abundantly throughout the year. Between latitude 36° and latitude 38° it is a regular winter resident, occurring in flocks, but is not abundant; north of latitude 38°, although many are found each winter, they are merely single birds, that have found exceptionally favorable quarters. In the winter of 1883–'84 it was reported from as far north as southern Wisconsin (at Delavan). In the West it is not common in winter north of latitude 33°. In the spring of 1884, during the latter part of February, slight movements occurred, and a few 'firsts' were noted, but probably these were birds that had wintered not far off and were merely changing their feeding grounds. No real movement took place until about a week after the Passenger Pigeons commenced flying. In its northward progress the Carolina Dove averages about one week behind the Pigeon. March 23 and 24 it appeared at Saint Louis and neighboring points. March 28 to 30 seem to have been days of much movement, the van advancing from latitude 42° on the 28th to latitude 43° 43′ on the 30th. By April 6 it had reached Elk River, Minn. (latitude 45° 45′), and on the 11th, farther west, was reported from Linwood, Nebr., and Vermillion, Dak. The Dove ceases to be common as we approach our northern boundary, which has been given as the northern limit of its range. Nevertheless, I always found a few in Minnesota at latitude 47°, arriving the first week in May, and on the last day of May, in 1884, it appeared at Portage la Prairie, Manitoba (latitude 50°), where the species is common (Nash). At Winnepeg, Manitoba, it is rare (Seton).

In the fall of 1884 the bulk left Des Moines, Iowa, August 25, and the last was seen there the next day. During the winter of 1884–'85 the Mourning Dove was noted from Glasgow, Mo.; Reeds, Mo.; Shawneetown, Ill.; and Peoria, Ill. At Aledo, Ill., they are said to have been present during all previous winters, but none were seen there in 1885 until April. Migration began at Manhattan, Kans., March 5, and Paris, Ill., March 23. The birds reached Saint Louis, Mo., and Emporia, Kans., March 31, with a very early arrival at Leeds Centre, Wis., on the same date. During the first five days of April they were reported from Fayette, Mo.; Ferry, Iowa; Mount Pleasant, Iowa; Ames, Iowa; Grinnell, Iowa; Peoria, Ill.; Aledo, Ill.; Rockford, Ill.; and Durand, Wis.; but no regular progression can be traced from the first to the fifth of these days. There was no further advance until April 17 to 20, when they were noted from Fernwood, Ill.; Delavan, Wis.; New Cassel, Wis.; Ripon, Wis.; River Falls, Wis.; and Lanesboro, Minn. They were seen at Huron, Dak., April 23; Hastings, Minn., April 24; Argusville, Dak., April 25; and Menoken, Dak., May 10.

In the fall of 1885 the last was seen at Elk River, Minn., October 7; at Grinnell, Iowa, November 4; at Iowa City, Iowa, October 11; and at

Des Moines, Iowa, October 24. They began to flock at Shawneetown, Ill., August 20.

318. Engyptila albifrons (Bonap.). [463.] *White-fronted Dove.*

This Mexican species comes north in summer as far as the Lower Rio Grande valley in Texas, where it is not an uncommon breeder (Sennett and Merrill).

319. Melopelia leucoptera (Linn.). [464.] *White-winged Dove.*

This tropical American Dove comes north regularly as far as southern Texas, where it breeds abundantly. It was reported as a summer resident at Eagle Pass.

320. Columbigallina passerina (Linn.). [465.] *Ground Dove.*

Like the last, this Dove was reported from Eagle Pass only; but it ranges during the summer through most of the Southern States south of latitude 32°, being most common near the coast; a straggler was once taken at Locke, Mich.

321. Scardafella inca (Less.). [466.] *Inca Dove.*

A Mexican species, coming north to southern Texas. At Laredo, Tex., it is abundant. (Dr. H. B. Butcher, Proc. Acad. Nat. Sci. Phila., Vol. XX, 1868, p. 150.)

325. Cathartes aura (Linn.). [454.] *Turkey Buzzard; Turkey Vulture.*

An abundant breeder throughout most of the Mississippi Valley. Ordinarily it winters from about latitude 39° southward, though it was reported by Dr. Agersborg as usually resident at Vermillion, Dak., latitude 42° 56′. A short distance south of latitude 39° it is an abundant resident. Dr. Watson saw it at Ellis, Kans., during the warm intervals in the winter of 1883–'84. At Caddo, Ind. Ter., it was a most abundant winter as well as summer resident, and yet so great was the mortality among the cattle, that all the Buzzards and Carrion Crows together could not rid the prairies of their carcasses. In the fall and early winter, when cattle feed was good and dead animals were few, these two species had hard work to get a living. They could be seen sailing overhead in great flocks watching for food, or sitting in long lines on the fences. An animal killed in the morning would be picked clean by night, and there was great quarreling and fighting over the carcass. After the snows and freezing rains came cattle began to die by the hundred, and before spring more than 15,000 died within 30 miles of Caddo. Then scarcely a Buzzard was ever seen in the air. They became so particular that they would not touch a carcass on the prairie, but selecting those that had fallen in or near timber, would gorge themselves, fly heavily to the nearest tree, and stay there until there was room in their bodies for more of their disgusting food. All Texas observers except Mr. Lloyd record the Turkey Buzzard as a winter resident. Mr. Lloyd states that it never winters in Tom Green or Concho counties (where it is an abundant summer resident), though he found it wintering in great numbers at the Nueces cañon, south of San Angelo. In the spring of 1884 the first reached San Angelo March 11, and the next day they were numerous. A single one had been seen at Saint Louis February 26, but the general movement commenced there three weeks later. On March 16 they appeared at Hillsborough, Ill. (latitude 39° 12′), and at Mount Carmel, Mo. (latitude 38° 45′). By March 27 they had advanced to latitude 40°. April 4 and 5 found them at latitude 41° and 42° in Iowa, and April 9 at latitude 41° 58′ in Illinois; April 12 they were seen at Williamstown, Iowa (latitude 42° 55′), and April 20, at Huron, Dak. (latitude 44° 21′). This is rather late migration, for I used to note them at latitude 47° in Minnesota the first week in April. They were not reported from Portage la Prairie, Manitoba, until May 23. They are common in summer in the Assiniboine valley (Seton). Their farthest extension north occurs in our district, where they have been traced to latitude 53° in Manitoba, while on the Atlantic coast they are rare above latitude 40°.

In the fall of 1884 the bulk of Turkey Buzzards left Williamstown, Iowa, September 25; and the last was seen at Mount Carmel, Mo., October 22. It is reported to have spent the winter of 1884–'85 at Shawneetown, Ill.

The records of the northward movement in the spring of 1885 are too irregular for systematic arrangement. The most northern records received are: Manhattan, Kans., April 4; Lanesboro, Minn., April 27; and Hennepin, Ill., April 6. In none of the records for 1883, 1884, or 1885 do the dates of arrival correspond with the times at which I noted the species at White Earth, Minn., during the three previous years. They came there with the first large wave of spring migration. In 1880 the first was seen April 1, just after the arrival of the Robin, Red-winged Blackbird, and Mallard, which came during the last days of March. The next year, 1881, spring migration was late, and no Turkey Buzzards were seen until April 8; the first Robin, April 14; the first Golden-shafted Flickers, Red-winged Blackbirds, and Mallards, April 17. The average temperature from April 1 to 6 was 3 degrees below zero. April 2 and 3, 1882, were very different, snow melting rapidly, roads so bare as to forbid the use of sleighs, and a general feeling of spring everywhere. During these two days the first arrivals were noted of Turkey Buzzards, Canada Geese, Red-tailed Hawks, Marsh Hawks, Sparrow Hawks, Red-winged Blackbirds, Killdeer, Meadowlarks, and Ring-billed Gulls, with the first Robin two days later. During the spring of 1885 I happened to revisit White Earth just as the first wave of migration arrived. April 4, 5, and 6 it brought the Sparrow Hawk, Red-tailed Hawk, Marsh Hawk, Killdeer, Robin, Red-winged Blackbird, Brewer's Blackbird, Meadowlark, and Brown Crane, but not a single Turkey Buzzard was seen. In the fall of 1885, at Iowa City, Iowa, the last Turkey Buzzard was seen October 3; at Grinnell, Iowa, November 4, and at Fayette, Mo., October 28.

326. Catharista atrata (Bartr.). [455.] *Black Vulture; Carrion Crow.*

This short-winged cousin of the Turkey Buzzard is his constant companion in the Southern States, but is left far behind in the vernal race for the frigid zone. The Carrion Crow is content to remain in or near his winter home and become common scavenger all the year round. He is scarcely migratory, his movements being wanderings rather than migrations. As in the case of the Turkey Buzzard, he shuns San Angelo during the winter, though he returned there March 19, 1884. Up the Mississippi Valley he is found resident as far north as southern Illinois, and has been taken once in Ohio. He has been seen twice in southern Kansas and once nested there. At Ellis, in western Kansas, Dr. Watson captured one March 27, 1885, the only record for that locality. From latitude 36° to 38° he has the mixed character of both resident and summer resident, remaining in some places the whole year and appearing at others in the summer only.

327. Elanoides forficatus (Linn.). [426.] *Swallow-tailed Kite.*

This beautiful and graceful species breeds sparingly throughout the Mississippi Valley from the Gulf of Mexico to Minnesota and Dakota, but is most abundant in the Southern States. It winters in Central and South America, but Mr. Bibbins recorded it as a rare winter visitant at Mermenton, La., and Major Young mentioned it as a winter bird at Waverly, Miss. A most extraordinary winter record is that given in the Bull. Nutt. Ornith. Club (Vol. III, 1878 p. 147), where the species is said to be found in winter and early spring on the James river, in southeastern Dakota. Again, November 14, 1881, Mr. D. H. Talbot saw several a short distance west of Jamestown, Dak., and three days later, about midway between Jamestown and Bismarck, he saw fifty or more in a flock (Bull. Nutt Ornith. Club, Vol. VII, 1882, p. 59). It is incomprehensible how a bird which so constantly shuns cold weather could stand the terrible winters of southern Dakota. It is safe to say that none were within the limits of Dakota in January, 1884.

In the spring of 1884 I observed it at Caddo, Ind. Ter., April 1, and then, changing my residence to Red Rock, in the northern part of the Territory, I again noted its arrival April 12. At Fayette, Mo., it was seen May 9, and at Iowa City, Iowa, May 13. It is in the Mississippi Valley that the species finds its most northern range. In Minnesota it has been traced to Red Lake (latitude 48° 30′), and in Dakota, to Pembina (latitude 49°). Recently it has been recorded from Manitoba (The Auk, Vol. III, 1886, p. 328).

In the spring of 1885 the Swallow-tailed Kite reached Elk River, Minn., May 4. In the fall of 1885 the first arrival was recorded from Grinnell, Iowa, September 16. It was last seen at Saint Louis, Mo., August 20. Dr. Agersborg states that a few spend the summer at Vermillion, Dak.

328. Elanus leucurus (Vieill.). [427.] *White-tailed Kite.*

A southern species, ranging from southern Illinois and Indian Territory to Chili and Buenos Ayres. In western Texas Mr. Lloyd records it as a rare fall visitor. In the valley of the Lower Rio Grande it is rather rare (Merrill and Sennett). In eastern Texas, near Houston, Mr. Nehrling says of it:

> This rare and beautiful bird I have seen several times sailing over cotton fields. Its flight is easy and graceful, but not rapid; sometimes it stops a few moments and then descends with great velocity to the ground to capture a lizard or a snake. It is not shy, and is easily recognized by its white tail.

329. Ictinia mississippiensis (Wils.). [428.] *Mississippi Kite.*

Winters from the Southern States southward, and in summer passes up the Mississippi Valley regularly to Kansas and southern Illinois, and rarely to Wisconsin. At San Angelo, Tex., it is common in fall, and a few remain through the summer. In the spring of 1884 it arrived at Gainesville, Tex., April 23, and at Saint Louis, Mo., May 10.

In the fall of 1884, during September and October, it was common in small flocks at San Angelo, Tex.

In the spring of 1885 it appeared at Gainesville, Tex., May 6. In the fall of 1885 it was last seen at Saint Louis, Mo., August 18. In eastern Texas, near Houston, it breeds, but is not common (Nehrling).

331. Circus hudsonius (Linn.). [430.] *Marsh Hawk.*

Occurs over the whole of Manitoba and the Mississippi Valley in summer, and from northern Illinois and northern Kansas southward in winter. In western Texas it is an abundant resident. The most northern record in the winter of 1883–'84 was from Vermillion, Dak., where a few were seen in January. At Newton, Iowa, Mr. Preston says they usually winter, but none were seen from the fall of 1883 until March, 1884. At Caddo, Ind. Ter., they were twice as numerous during the winter of 1883–'84 as all the other species of hawks together, and were in the proportion of about three brown-colored to one blue individual. In the spring of 1884 they came to Saint Louis, Mo., and Newton, Iowa, March 10 and 11. March 18 they were seen at Lanesboro, Minn.; March 24 at Elk River, Minn.; April 11 at Portage la Prairie, Manitoba; and April 27 at Oak Point, Manitoba.

During the winter of 1884–'85 the Marsh Hawk was plentiful at Paris, Ill.

The notes on the spring migration in 1885 were very irregular, and extended over an entire month, from March 9, when the first was noted in central Iowa, to April 9, when it arrived at latitude 50° in Manitoba. In the fall of 1885 the last at Ossowo, Manitoba, was seen November 12; at Grinnell, Iowa, October 11; and November 6 it became common at Bonham, Tex.

332. Accipiter velox (Wils.). [432.] *Sharp-shinned Hawk.*

Range much the same as that of Cooper's Hawk, but a little more northern. In the spring of 1884 very few notes were contributed on its movements, and they relate to its arrival at latitude 41° 30′ in Illinois and Iowa about the middle of March, and at Portage la Prairie, Manitoba, April 16.

In the spring of 1885 the Sharp-shinned Hawk was noted, without any regularity, from various stations from Mount Carmel, Mo., February 17 (next one seen April 7), to Minneapolis, Minn., April 9.

In the fall of 1885 the first was seen at Bonham, Tex., October 14, and the last at Mount Carmel, Mo., October 16. In western Texas it is "abundant in fall; less so in winter" (Lloyd).

333. Accipiter cooperi (Bonap.). [431.] *Cooper's Hawk.*

Breeds throughout the Mississippi Valley, wintering in the southern parts. In the winter of 1883–'84 there was no record north of latitude 38°. One was caught at Pierce City, Mo., in the latter part of February, whose feathers were so coated with ice that it could not fly. In the spring of 1884 it reached Saint Louis March 11; March 25 and 26 was seen at Danville, Ill., and Laporte City, Iowa; and was reported from Fridley, Minn., March 18.

In the spring of 1885 the first Cooper's Hawk was seen at Mount Carmel, Mo., April 5, and the last May 10. The first was noted at Grinnell, Iowa, March 31; Laporte City, Iowa, and Lake City, Minn., April 26. In the fall of 1885 the last was seen at Mount Carmel October 30. In western Texas it is found with the preceding, common in fall and not rare in winter.

334. Accipiter atricapillus (Wils.) [433.] *Goshawk.*

A tolerably common fall and winter visitant in Manitoba (Seton), and a rare winter visitant to the northern part of the Mississippi Valley, coming south to Kansas, Missouri, and Illinois. Given by Mr. Agersborg as a winter visitor at Vermillion, Dak., but rare.

In the spring of 1885 a Goshawk was seen at Lanesboro, Minn., April 4.

334a. Accipiter atricapillus striatulus Ridgw. [433*a*.] *Western Goshawk.*

Mr. Lloyd states that in western Texas, in December, 1885, he shot a male Western Goshawk and saw its mate several times.

335. Parabuteo unicinctus harrisi (Aud.). [434.] *Harris's Hawk.*

The normal range of Harris's Hawk is from southern Louisiana and southern Texas southward. In the valley of the Lower Rio Grande, in Texas, it is an abundant resident. At Eagle Pass, in southwestern Texas, it was reported as an abundant summer resident.

337. Buteo borealis (Gmel.). [436.] *Red-tailed Hawk.*

Breeds throughout Manitoba and the Mississippi Valley, and stays quite far north in winter. During the winter of 1884–'85 it was reported from Vermillion, Dak., and Chicago, Ill.

In the spring of 1884 it was reported from various parts of Iowa, about the middle of March; from Lanesboro, Minn., March 2 (two being seen during a furious storm, and it was repeatedly seen the next week). April 3 it appeared at Two Rivers, Manitoba (latitude 49° 28′); and April 12 it reached Oak Point, Manitoba.

In the spring of 1885 the Red-tailed Hawk was seen at Laporte City, Iowa, March 3, and at Lake City, Minn., March 26. Various irregular notes were given from intervening places.

In the fall of 1885 the first returning migrants reached Bonham, Tex., November 10, and were common there November 19.

337a. Buteo borealis kriderii Hoopes. [436*a*.] *Krider's Hawk.*

An inhabitant of the Great Plains, the eastern limit of its range covering the western part of the Mississippi Valley from Minnesota to Texas. Has been taken in Minnesota, Wisconsin, Iowa, northeastern Illinois, Kansas, and Texas. Roberts and Benner took a young Krider's Hawk from the nest in western Minnesota in June, 1879, and Mr. Ridgway tells me he has examined two females shot from the nest in Minnesota.

337b. Buteo borealis calurus (Cass.). [436*b*.] *Western Red-tail.*

The Western Red-tail reaches the western border of the Mississippi Valley district. Colonel Goss records it as not uncommon in Kansas in winter. It has been taken also in Illinois, near Chicago (Nelson). The only observer who has had the good fortune to secure it is Mr. Lloyd, who finds it an abundant resident in Concho county, Tex., where it breeds from April 22 to May 22.

338. Buteo harlani (Aud.). [438.] *Harlan's Hawk.*

Harlan's Hawk is an inhabitant of the Gulf States and the lower Mississippi Valley, and has been found as far north as Kansas, Illinois, and Iowa. It was reported by one of the observers in former years from Liter, Ill., and has also been found at Warsaw, Ill., and at Gainesville, Tex. Nothing is known of its movements and breeding habits. The species was described by Audubon from a specimen killed in Louisiana.

339. Buteo lineatus (Gmel.). [439.] *Red-shouldered Hawk.*

The movements of this species are similar to those of the Red-tailed Hawk, with which it is often found during migration, but it does not go so far north, seldom passing beyond our northern boundary. In eastern Kansas it is a common resident (Goss). Both it and the Red-tail intended to spend the winter of 1883–'84, as usual, in the vicinity of Saint Louis, but the severe cold of the first week in January proved too much for them, and they migrated, to return with the first warm wave the last of the month. It was reported as wintering at Chicago, and as a rare winter resident in southern Missouri. It migrated at the same time as the Red-tail, and at Elk River, Minn., where the latter was not seen, it arrived March 24.

In the spring of 1885 the only record received on the migration of the Red-shouldered Hawk was a note of its arrival at Mount Carmel, Mo., April 5. In the fall of 1885 it appeared at Bonham, Tex., November 23. Mr. Lloyd says it is a rare resident in western Texas.

340. **Buteo abbreviatus** Caban. [440.] *Zone-tailed Hawk.*

This southwestern Hawk is a fall visitant in Tom Green and Concho counties, Tex., where it was noted September 10, 1884 (Lloyd). In Comal county, Tex., it was found breeding in May, 1878, by Mr. W. H. Werner, who secured a male specimen and a set of eggs. Two pairs were observed (Brewster, Bull. Nutt. Ornith. Club, Vol. IV, 1879, p. 80).

341. **Buteo albicaudatus** Vieill. [441.] *White-tailed Hawk.*

A southwestern species, breeding along the Rio Grande in Texas (Sennett and Merrill), and occurring in western Texas in fall and winter (Lloyd).

342. **Buteo swainsoni** Bonap. [442.] *Swainson's Hawk.*

Swainson's Hawk is common in Manitoba and along the Red River of the North, and it occurs throughout most of the Mississippi Valley, and thence west to the Pacific. It remains in the West quite far north during cold weather, and is a common resident in western Kansas and western Texas. Even in eastern Texas, near Houston, it is "not uncommon during the breeding season" (Nehrling). In 1884 a few were seen in January at Vermillion, Dak. It was not seen in Iowa until migration commenced. About April 1 it appeared at Newton and Laporte City.

In the spring of 1885 Swainson's Hawk was recorded at Newton, Iowa, April 16, and March 23 at Laporte City, Iowa. A nest with three eggs was found May 13 at San Angelo, Tex.

In the fall of 1885 the first south-bound migrant was seen at Emporia, Kans., October 10.

343. **Buteo latissimus** (Wils.). [443.] *Broad-winged Hawk.*

This is the only distinctively *eastern* Hawk occurring in the Mississippi Valley. It is found only rarely so far west as Kansas, the most westerly record being that of Dr. Watson, at Ellis, Kans. It breeds principally in the northern part of its range, being quite common in Minnesota (though it has been known to nest even in southern Texas), and in winter it passes south to Florida, and even to Central and South America. In spring migration in 1884 it passed through central Iowa about the middle of April, but only a few notes on it were reported.

In the spring of 1885 the Broad-winged Hawk arrived at Mount Carmel, Mo., March 23, at Laporte City, Iowa, March 30, and at Grinnell, Iowa, April 17. In the fall of 1885 none were seen at Mount Carmel, Mo., after September 12.

346. Asturina plagiata Schlegel. [445.] *Mexican Goshawk.*

The Mexican Goshawk occurs regularly as far north as the southern border of the United States, and occasionally up the Mississippi Valley to southern Illinois.

347a. Archibuteo lagopus sancti-johannis (Gmel.). [447.] *American Rough-legged Hawk.*

The whole army of these Hawks crosses our northern boundary twice a year. During the winter they are distributed over most of the Mississippi Valley, the exceptions being the extreme northern and extreme southern portions. They are most numerous in the middle sections, thinning out each way. At Elk River, Minn., all had passed south by December 24, 1883. A little south of this point they remained all winter. At Vermillion, Dak., ten were seen during a day's tramp in January, 1884. At Mount Carmel, Mo., they were quite common all winter on the prairies, the bulk leaving March 10, and the last on the 24th.

In the fall of 1884 the first Rough-legged Hawk was seen at Mount Carmel, Mo., November 7. It used to be abundant there during the winter, but now is somewhat rare.

In the spring of 1885 the last was seen at Mount Carmel March 15. The first appeared at Oak Point, Manitoba, April 7, and they were common there April 10. In the fall of 1885 they returned to Mount Carmel November 10; the next was seen November 12, and by November 20 they were in usual winter numbers.

348. Archibuteo ferrugineus (Licht.). [448.] *Ferruginous Rough-leg; Ferruginous Buzzard.*

Chiefly a western species, a few coming east into the Mississippi Valley. It is resident in western Kansas, where Dr. Watson says it is tolerably common at Ellis every year. It has also been seen in western Nebraska, and is abundant in western Texas in winter. It has been seen once at Rock Island, Ill., and has been found nesting at Vermillion, Dak., and Grinnell, Iowa.

Mr. Balmer writes from Paris, Ill.: "On January 19, 1886, I had the good fortune to capture what I consider a rare bird for this State, viz, *Archibuteo ferrugineus.* He seems to have got a long way out of his latitude. He came with a thaw, in a south wind, after our big, big blizzard. I shot him out of a tree after dark, having marked him down for the night. The bird is a male, and measured 53 inches in extent."

349. Aquila chrysaëtos (Linn.). [449.] *Golden Eagle.*

In the western mountains this species comes far south in winter, even to New Mexico and Arizona, but nearer the Mississippi it comes only to Kansas. Some years ago one was taken in November at Fayette, in central Missouri, but it is very rare so far south. Several were seen and some captured in central and northern Iowa in the winter of 1883–'84, the last ones leaving from March 15 to 22. Most Golden

Eagles retire in spring to British America to breed, but Mr. Ridgway says that a few still breed in Northern Illinois, and they probably do so in northern Minnesota, as I have seen them there about the first of June.

In the spring of 1885 a Golden Eagle was reported from Paris, Ill., March 6; from Laporte City, Iowa, March 14; and from Williamstown, Iowa, March 30. Even as late as April 19 one was shot at Mount Carmel, Mo.

350. **Thrasaëtus harpyia** (Linn.). [450.] *Harpy Eagle.*

A tropical American species, rarely straggling as far north as our southern border. Said to have been taken once in Texas, at the delta of the Rio Grande (Oswald, Am. Nat., 1878, p. 151).

352. **Haliæëtus leucocephalus** (Linn.). [451.] *Bald Eagle.*

Locally distributed throughout the whole of North America. It has no regular migration, but after breeding throughout the Mississippi Valley it disappears from some places for the winter, while it remains at others. Generally speaking, it leaves the North when the freezing of the waters prevents it from getting its accustomed food, but sometimes it remains through the winter even as far north as latitude 47° in Minnesota, where, in the heavy pine forests, I have found it throughout the year, and where it nests quite commonly. In the spring of 1884 it moved back to summer quarters in northern Iowa about March 20.

In western Texas it is an abundant resident (Lloyd). In the fall of 1885, at Saint Louis, Mo., the first Bald Eagle was seen September 9. November 7 four were seen, and the next day two more.

354. **Falco rusticolus** Linn. [412a.] *Gray Gyrfalcon; Iceland Gyrfalcon.*

An accidental winter visitant from the north. A specimen was captured at Manhattan, Kans., December 1, 1880.

354a. **Falco rusticolus gyrfalco** (Linn.). [412b.] *Gyrfalcon: McFarlane's Gyrfalcon.*

Like the last, an accidental visitor in winter. Taken by Dr. Agersborg, at Vermillion, Dak., October 21, 1880.

354b. **Falco rusticolus obsoletus** (Gmel.). [412c.] *Black Gyrfalcon; Labrador Gyrfalcon.*

Has been taken in Minnesota a few times as a rare winter visitant; a specimen has been examined by Mr. Ridgway.

355. **Falco mexicanus** Schleg. [413.] *Prairie Falcon.*

This hawk is found principally in the West, but occurs east to the eastern border of the plains in Texas, Indian Territory, Missouri, Kansas, Nebraska, and Dakota. It winters from Kansas southward, and passes north in the summer to central Dakota, where it was noted as being very common in August. Dr. Agersborg gave it as a rare migrant in southeastern Dakota, but it is known to breed in Kansas, Missouri (Goss), and Texas. Mr. Nehrling states that it is resident, but not common, near Houston, in eastern Texas. It has been found in central Iowa, and even as far east as Illinois.

356. **Falco peregrinus anatum** (Bonap.). [414.] *Duck Hawk; Peregrine Falcon.*

This species occurs locally throughout the Mississippi Valley. It breeds more particularly in Manitoba and the northern half of the United States, but is known to breed also in Kansas, Mississippi, and Texas. In the fall of 1884 the last Duck Hawk was seen at Mount Carmel, Mo., November 12.

In the spring of 1885 it was seen April 4 at Lake City, Minn., and April 25 at Mount Carmel, Mo.

357. **Falco columbarius** Linn. [417.] *Pigeon Hawk.*

Occurs over the whole of the Mississipi Valley, but is nowhere abundant; winters in the Southern States and southward; breeds in British America. A few stragglers were found at San Angelo, Tex., in the winter of 1883–'84, the last of which left February 1, being the first bird to migrate. Near Houston, in eastern Texas, it is common in fall and winter (Nehrling). At Heron Lake, Minn., the first was noted March 27; and none were seen at Manhattan, Kans., until April 12. In the spring of 1885 the Pigeon Hawk was recorded from Ferry, Iowa, March 30; Clinton, Wis., March 31; Delavan, Wis., April 11; and Ossowo, Manitoba, April 18. In the fall of 1885 the first at Emporia, Kans., was noted October 10.

358. **Falco richardsonii** Ridgw. [418.] *Richardson's Merlin.*

Found principally on the Great Plains, and thence westward, but is most common just east of the Rocky mountains; south to Texas in winter; has occurred accidently in Michigan, and occasionally in Minnesota. Professor Aughey recorded it as rather common, and breeding, in Nebraska. Dr. Agersborg says it is a migrant in southeastern Dakota. Mr. Powell reports it from southeastern Nebraska. It probably breeds in western Kansas, where Colonel Goss says it is not uncommon. At Ellis, Kans., Dr. Watson noted the arrival of the first April 15, 1884. An accidental visitor has been recorded from Laporte City, Iowa.

359. **Falco fusco-cœrulescens** Vieill. [419.] *Aplomado Falcon.*

A tropical American species, breeding in the valley of the Lower Rio Grande in Texas (Merrill).

360. **Falco sparverius** Linn. [420.] *Sparrow Hawk.*

Inhabits the whole of Manitoba and the Mississippi Valley, and breeds throughout its range; but in Indian Territory and eastern Texas it is apparently rare and local as a breeder. In Tom Green and Concho counties, Tex., it is an abundant resident (Lloyd), but the summer birds pass south in winter and their places are taken by northern birds, so that the species is found all the time, though the same individuals are not present. Nests containing, respectively, five and six eggs were found near San Angelo March 15 and July 1, indicating two broods. This Hawk is said to have remained at Chicago the whole of the winter of 1883-'84. With this exception no winter record was received from any point north of latitude 37°.

In the spring of 1884 a single bird was seen at Saint Louis February 26, and a few days later (March 3) most of the winter residents were leaving Caddo, Ind. Ter. (latitude 34° 11′). In the case of this species, as in many others, no records of movement were made during the first two and one-half weeks of March. March 21 it appeared at Tampico, Ill. (latitude 41° 36′), and at Ellis, Kans. (latitude 38° 55′). By March 26 it had been seen along the Mississippi river as far north as Elk River, Minn. (latitude 45° 25′); and almost a month later (April 20) it appeared at Oak Point, Manitoba (latitude 50° 30′). In northern Illinois and Wisconsin arrivals were recorded until April 2.

In the fall of 1884 the last Sparrow Hawk at Mount Carmel, Mo., was seen September 27. It was reported as wintering at Shawneetown, Ill.

In the spring of 1885 the records of its northward movement were very irregular. They fell between the dates of March 14, at Tampico, Ill., and April 15, at Oak Point, Manitoba. The first was seen at White Earth, Minn., April 4. In the fall of 1885 the last at Grinnell, Ia., was recorded October 10, and at Mount Carmel, Mo., October 22.

362. Polyborus cheriway (Jacq.). [423.] *Audubon's Caracara; Caracara Eagle.*

Common along the Gulf coast, and abundant in southern Texas. At Eagle Pass and Mason, Tex., it was recorded as common and resident. At Eagle Pass it was building March 16, 1884.

Mr. Lloyd says of it:

> Resident in the eastern part of Concho county; a few visit the western half in fall; none seen in Tom Green county. Breeds. Nest found in live-oak, about 18 feet from the ground, with three eggs, April 24, 1881. The same nest was used for two years after. Though in the southern part of Texas they prey on carrion, in Menard and Concho counties they hunt prairie dogs in couples. (The Auk, Vol. IV, 1887, p. 189.)

Mr. Nehrling states that in eastern Texas, near Houston, it is regularly distributed, but not so common as in the interior. He says of it:

> It is a very showy bird, and the flight is extremely elegant and quick. Although it is very shy and not easily to be approached, it often builds its nest in trees not far from farm houses. The farmers say they are as harmless as Turkey Buzzards. The nest is usually from 25 to 30 feet above the ground, and is built of sticks, sometimes lined with bits of cotton and Spanish moss; the cavity is shallow. Often the birds, commonly single individuals, are to be observed with Vultures, feeding together on carrion. (Bull. Nutt. Orinth. Club, Vol. VII, 1882, p. 173.)

364. Pandion haliaëtus carolinensis (Gmel.). [425.] *Osprey; Fish-Hawk.*

Occupies the southern half of our district in winter, and the whole Mississippi Valley in summer. It migrates rather late. In 1884 it appeared at Newton, Iowa, April 12; at Laporte City, Iowa, April 15;

at Ellis, Kans., April 16; at Lanesboro and Red Wing, Minn., April 18 and 20, and at Alda, Nebr., April 25.

In the fall of 1885 the first southward migrant was seen at Emporia, Kans., September 30.

365. **Strix pratincola** Bonap. [394.] *Barn Owl.*

The Barn Owl is most abundant in the Southern States, where it is resident. It occurs north to Minnesota and Wisconsin (noted from La Crosse and Ripon), and west to Kansas and Nebraska. In western Texas it is rare (Lloyd); in eastern Texas common (Nehrling).

366. **Asio wilsonianus** (Less.). [395.] *Long-eared Owl.*

A common summer resident in western Manitoba; resident throughout the Mississippi Valley.

367. **Asio accipitrinus** (Pall.). [396.] *Short-eared Owl.*

A common summer resident in western Manitoba and Dakota. It occupies the whole of the Mississippi Valley; Resident in the northern half; occurs in the lower half chiefly in fall and winter.

368. **Syrnium nebulosum** (Forst.). [397.] *Barred Owl.*

The most common Owl of the Southern States, and found also over the whole of the Mississippi Valley and Manitoba; resident except in the extreme northern part of its range. At Caddo, Ind. Ter., the pellets thrown up at one time by a Barred Owl contained parts of a Brewer's Blackbird, a Cardinal Grosbeak, and a Le Conte's Sparrow.

368a. **Syrnium nebulosum alleni** Ridgw. (397*a*.) *Florida Barred Owl.*

Recently Mr. Ragsdale has taken this owl, previously known only from Florida, in Cook County, Tex. A specimen has been examined by Mr. Ridgway, and is now in the U. S. National Museum.

370. **Ulula cinerea** (Gmel.). [399.] *Great Gray Owl.*

A northern species; found occasionally in winter in Minnesota, Wisconsin, and Illinois.

371. **Nyctala tengmalmi richardsoni** (Bonap.). [400.] *Richardson's Owl.*

Another northern bird, occurring in winter in Minnesota, Wisconsin, and Iowa.

372. **Nyctala acadica** (Gmel.). [401.] *Saw-whet Owl.*

A common resident from northern Illinois northward; south of this a rare winter visitant.

373. **Megascops asio** (Linn.). [402.] *Screech Owl.*

An abundant resident throughout most of the Mississippi Valley, but said not to be very common in Minnesota. Mr. Carr killed one in the winter of 1883–'84 at Waupaca, Wis., which had nothing in its stomach but wheat, buckwheat, and miscellaneous seeds.

373a. Megascops asio floridanus (Ridgw.). [402*a.*] *Florida Screech Owl.*

This form of the Screech Owl, previously known only from South Carolina to Florida, was procured in southern Louisiana by Dr. A. K. Fisher, who examined several specimens.

373b. Megascops asio mccallii (Cass.). [402*b.*] *Texas Screech Owl.*

Resident in Texas, whence reported from Tom Green and Concho counties, where it is abundant in winter from about September 10 to March 10 (Lloyd). In eastern Texas, near Houston, it seems to be common (Nehrling).

375. Bubo virginianus (Gmel.). [405.] *Great Horned Owl.*

A common resident over the whole of the Mississippi Valley east of the Great Plains.

The following unique owl story was contributed by Mr. H. F. Peters, of Bonham, in northeastern Texas:

> On the 10th of March, 1883, I was out hunting in some woods, and flushed a Great Horned Owl from a large stump about 20 feet high. I shot at and missed it, but coming up to the stump I could see an Owl's head above the top of it. I would not shoot him there as I did not want to climb for him. It was hard work to make him leave the stump, but, by nearly hitting him with a stick, he flew off and I killed him. He was a young Great Horned Owl. When he left the nest I distinctly saw something move there. My son climbed up and found two owlets about six or eight days old. We left them there, and that evening at dusk I killed a female Barred Owl, and the next morning a male Barred Owl off the top of the same stump where the young ones were. We then secured the two young owls and kept them a year, until they grew to be two fine Barred Owls. A few days later I killed two Great Horned Owls (a male and female) in close proximity to the place. Thus we have a case of two species of owls breeding at the same time in the same nest, with at least a month's difference in the ages of the young. The young Horned Owl was barely fledged, and I am sure had never been out of the nest until I drove him out. There were bones and offal around the stump, showing that it had been used for some time as a breeding place.

375a. Bubo virginianus subarcticus (Hoy). [405*a* in part.] *Western Horned Owl.*

This is the western representative of the Great Horned Owl. It breeds from western Manitoba and Dakota southward, over the Great Plains, to Texas, and even to the table-lands of Mexico. Stragglers have been taken in Wisconsin and northern Illinois. Dr. Agersborg states that it occurs in southeastern Dakota nearly every winter. In Tom Green and Concho counties, in western Texas, where it is an "abundant resident," Mr. Lloyd says of it:

> Breeds from February 20 to end of May in hackberry or mesquit on prairies, and in holes in the large pecans on rivers. I have rarely found more than two eggs in one clutch; three, however, occur in about one nest in six. Feeds on poultry, skunks, and rabbits, and is often on wing during the day. The birds seem to grow lighter with age. (The Auk, Vol. IV, 1887, p. 190.)

375b. Bubo virginianus arcticus (Swains.). [405*b.*] *Arctic Horned Owl.*

Breeds in Arctic America, coming south in winter, irregularly and rarely to Dakota, Montana, and Wyoming.

376. Nyctea nyctea (Linn.). [406.] *Snowy Owl.*

A great wanderer in winter, visiting the United States, and appearing without any regularity in all of the northern tier of States, and southward into Kansas, Missouri, and Illinois, and has been taken even in Texas. It seems to have been less common than usual in the winter of 1883–'84, though Mr. Lindley, at Mitchell, Iowa, had the good fortune to see nine. At Linwood, Nebr., the last seen in 1884 was noted February 1, but at Heron Lake, Minn., one was seen as late as April 3. The winter of 1876–'77 was noted for the great numbers of Snowy Owls which migrated into the United States. They came November 22, 1876, and for two weeks afterwards were common as far south as Saint Louis. At Omaha and Denver they were specially abundant. One taxidermist in the East had thirty Snowy Owls sent him from this single flight.

In the spring of 1885 a Snowy Owl was seen at Clinton, Wis., February 23, and at Huron, Dak., March 7. In the fall of 1885 the first came to Elk River, Minn., October 23. At Chicago, Ill., one was seen in the city November 3. A magnificent specimen, almost pure white, was shot at Chrisman, Ill., the latter part of January, 1886.

377a. Surnia ulula caparoch (Müll.). [407.] *Hawk Owl.*

The Hawk Owl visits the upper Mississippi Valley in winter. It has been taken in winter in Minnesota and Wisconsin, and once in northern Illinois. Occasionally in severe winters it has been found in the East as far south as Pennsylvania. It is therefore the more strange that one should be found so far south as Mississippi. Dr. Rawlings Young, of Corinth, Miss., writes: "In January, 1882, I was shooting quail over a brace of setters in a thick sedge grass 300 or 400 yards from the timber, and while working up a scattered bevy the dogs pointed. Walking in, a Hawk Owl, much to my astonishment, got up from the grass right under the dogs' noses. As he went off I cut him down, and had no trouble in identifying him from the cuts seen in Wilson."

In the fall of 1884 a Hawk Owl was reported from Elk River, Minn., October 27. At Mount Carmel, Mo., the first was seen December 26. In January, 1885, about a dozen were reported as wintering at Elk River, Minn. In the spring of 1885, at Mount Carmel, Mo., the last was seen March 10. In the fall of 1885 the first returned to Elk River, Minn., October 23.

378. Speotyto cunicularia hypogæa (Bonap.). [408.] *Burrowing Owl.*

Wherever prairie dogs exist Burrowing Owls are also very likely to be found, so that their range may be said to include most of the open prairie ground west of the Mississippi river. They are especially abundant in western Nebraska, middle and western Kansas, and Indian Territory; and as I write from Red Rock, in that Territory, I can look out on a dog town several miles in extent, in which the Burrowing Owls are usually numerous. Even as far east as Waverly, Miss., Major Young writes that they were formerly quite common, but have not been seen for some time. Mr. Nehrling states that near Houston, in eastern Texas, they are "every year increasing in numbers." At San Angelo, Tex., they have been found breeding from April 1, to May 10.

The Burrowing Owl is resident from southeastern Dakota southward. By many it is erroneously supposed to hibernate, and it may be that some of the northernmost colonies change their dwelling places during the winter so as to disappear from certain localities at this season. Dr. Agersborg says that it is a permanent resident in southeastern Dakota, where from seven to nine eggs constitute a full clutch. He further states:

> In the winter as many as twenty of these birds may be found nestling together in one hole. They are always at such times abundantly supplied with food. I have found at one time forty-three mice and several Shore Larks scattered along the run to their common apartment. They forage in fine weather, and retreat to their dirty abodes when cold weather threatens.

It is possible that those individuals that spend the summer far north in Dakota actually and regularly migrate. In 1884 Mr. Edwards noted their return to Argusville, Dak. (latitude 47° 08′), April 30.

380. Glaucidium phalænoides (Daud.). [410.] *Ferruginous Pigmy Owl.*

A tropical American species, coming north to the valley of the Lower Rio Grande in Texas (Sennett).

382. Conurus carolinensis (Linn.). [392.] *Carolina Paroquet* or *Parakeet.*

This beautiful Parrot formerly was resident throughout the Mississippi Valley and the South Atlantic and Gulf States. It no longer exists in the northern part of its former range, and can scarcely be found north of latitude 36°. So far as known, it is now confined to isolated localities in the Gulf States and the lower Mississippi Valley. At Fayette, Mo., it was reported as present, though almost extinct. Formerly immense flocks were found all over Indian Territory. At present it is almost extinct in the eastern part of the Territory, though a few are still found around Caddo, and in the middle and western parts they are almost as numerous as ever.

Rhynchopsitta pachyrhyncha (Swains.). [391.] *Thick-billed Parrot.*

An abundant inhabitant of the pine forests of central and northern Mexico, coming north into southwestern Texas.

384. Crotophaga sulcirostris Swains. [390.] *Groove-billed Ani.*

A middle American species, coming north to Texas. It occurs in the valley of the Rio Grande (Sennett); and is a fall visitor in Concho and Tom Green counties, Tex., where one was shot in October, 1885, and several seen in October, 1886 (Lloyd).

385. Geococcyx californianus (Less.). [385.] *Road-runner; Chapparal Cock.*

A southwestern bird, noted by the Texas observers; resident wherever found. It was reported as abundant at Mason, Tex., and in Concho and Tom Green counties, breeding in the latter region from March 30 to May 8. Clutches of five, six, and seven eggs were taken. This species has been captured as an accidental visitor in Arkansas, near Fort Lyons; and was seen by Mr. Trippe in Colorado north at least to latitude 38°, which has led to the surmise that it was the species seen by Mr. Cavanaugh in southwestern Kansas, and reported by him to Colonel Goss as the Sage Cock. Colonel Goss, in a recent communication, states that in September, 1884, Mr. Charles Dyer saw two of these birds in western Kansas, along the line of the Atchison, Topeka and Santa Fé Railway, about 15 miles east of the western boundary of the State; and that he "has seen them quite often in Colorado, near the State line." Colonel Goss further states:

> The birds are known to breed as far east as Las Animas, and I feel confident that they occasionally breed in the southwestern corner of this State [Kansas], a natural habitat of the birds, but unsettled and little known, especially as to its bird life. (The Auk, Vol. III, 1886, p. 114).

386. **Coccyzus minor** (Gmel.). [386.] *Mangrove Cuckoo.*

This tropical Cuckoo has been found as far north as the coast of Louisiana.

387. **Coccyzus americanus** (Linn.). [387.] *Yellow-billed Cuckoo.*

The range of this species is considerably more southern than that of the next. It breeds from the Gulf of Mexico to the northern tier of States. Both species are said to winter in Florida, but the bulk passes still further south.

In the spring of 1884 the Yellow-billed Cuckoo entered our southern border the latter part of April, appearing at Rodney, Miss., and at Mason, Tex., April 28 and 29. At San Angelo, Tex., and Saint Louis, Mo., it was seen May 5 and 6, and at Burlington, Iowa, May 8. At Gainesville, Tex., and Ellis, Kans., it arrived May 12, and at Manhattan, Kans., and Iowa City, Iowa, May 20. It came to Laporte City, Iowa, May 27. In Tom Green and Concho counties, Tex., it breeds in June. At Laporte, Iowa, on June 11, 1884, a female was shot with eggs ready for the nest.

In the fall of 1884 the bulk was reported as leaving Williamstown, Iowa, August 15, and the last August 27. The last was reported from Des Moines, Iowa, October 1; from Mount Carmel, Mo., September 21; and from San Angelo, Tex., August 15.

For the spring of 1885 the records of the movements of this species in the West were quite full. It appeared at San Antonio, Tex., April 17; at Mason, Tex., April 22; Bonham, Tex., April 29 (though it had been noticed April 20 at Gainesville, Tex.). May 14 it reached Manhattan, Kans. In Missouri it was seen at Saint Louis May 15, and at Mount Carmel May 17. By May 20 it had reached Des Moines, Iowa, and Fernwood, Ill.

In the fall of 1885 the last was seen at Iowa City, Iowa, August 26, and at Fernwood, Ill., September 11. At Saint Louis, Mo., it was conspicuous September 22, was present in bulk September 25, and was last seen September 27.

388. Coccyzus erythrophthalmus (Wils.). [388.] *Black-billed Cuckoo.*

A common summer resident in Manitoba and most parts of the Mississippi Valley except the extreme southern portion. In the spring of 1884 no records were received relating to the date when it entered the United States, but it appeared at Saint Louis, Mo., and at Hennepin, Ill., May 5. May 12 it was seen at Coralville, Iowa; May 16 at Lake Mills and New Cassel, Wis.; May 22 at Elk River, Minn.; May 31 at Portage la Prairie, Manitoba, and June 1 at Oak Point, Manitoba (latitude 50° 30′).

In the fall of 1884 the bulk left Williamstown, Iowa, August 10, and none were seen there after that date.

In the spring of 1885 no notes were sent but those of 'firsts,' and they are as follows: Saint Louis, Mo., May 15; Des Moines and Grinnell, Iowa, May 16; Iowa City, Iowa, and Hennepin, Fernwood, and Rockford, Ill., May 17; Heron Lake and Elk River, Minn., May 22; and Shell River, Manitoba, June 16.

In the fall of 1885, at Elk River, Minn., it was last seen September 7. At Saint Louis, Mo., it became conspicuous September 22; the bulk was present September 25, and departed September 29; and the last was seen October 16. In Concho county, Tex., it is a spring and fall migrant.

389. Trogon ambiguus Gould. [384.] *Coppery-tailed Trogon.*

The home of this Trogon is in central and northern Mexico. Two specimens were killed in southern Texas in the summer of 1877 (Merrill, Proc. U. S. Nat. Mus., Vol. I, 1878, p. 118).

390. Ceryle alcyon (Linn.). [382.] *Belted Kingfisher.*

The Kingfisher is a common summer resident in Manitoba and the Mississippi Valley. Its winter home is bounded on the north by the southern limit of frozen water. His food is found in the water, and when cut off from it by the ice he must migrate or perish. The extreme cold of the winter of 1883–'84 sent him much further south than usual. While often seen in ordinary winters at latitude 39° in Kansas, none stayed in this latitude during the winter of 1883–'84, nor was there a record from any point north of latitude 36°, though it is probable that at favorable places, such as spring-holes, a few may have wintered. From the nature of the case the northward movement of the Kingfisher is irregular. Near rivers which open early he will be among the first birds to arrive, while at neighboring ponds and lakes many days may pass before he appears. But even the presence or absence of ice fails to explain a large share of the irregular notes. In Concho and Tom Green counties, Tex., it is an abundant resident (Lloyd).

In the spring of 1884 a single individual was seen at Saint Louis, Mo., February 25, but the regular movement did not begin until March

22 and 23, when the species suddenly spread from latitude 39° to latitude 41° 38′ in Iowa, and latitude 41° 36′ in Illinois, with an adventurous bird at latitude 42° 18′ in Iowa and another at latitude 43° 43′ in Minnesota, which latter was reported to have been seen at intervals all winter. By April 6 the van had reached latitude 44° 47′ in Minnesota, and latitude 44° 22′ in Wisconsin. April 14 they were recorded from Elk River, Minn. (latitude 45° 25′); April 20 from Frazee City, Minn. (latitude 46° 33′), and May 5 from Portage la Prairie, Manitoba. In the West, as usual, they were later. At Gainesville, Tex., the first was heard March 17, and at Manhattan, Kans., two days later. At Ellis, Kans., none were seen until April 3; and April 21 they came to Vermillion, Dak.

In the fall of 1884 the bulk of the Kingfishers left Williamstown, Iowa, August 28, and the last on the same day. At Des Moines, Iowa, the last was seen September 17, and at Mount Carmel, Mo., October 12. At Lanesboro, Minn., a Kingfisher was seen December 5.

In the spring of 1885 the first noted in migration was seen at Paris, Ill., March 5, the next at Shawneetown, Ill., March 12; the next at Glasgow, Mo., and the next March 26, at Laporte City, Iowa, and at Mount Carmel, Mo. During the rest of March arrivals were noted from Manhattan, Kans.; Emporia, Kans.; Hennepin, Ill.; Saint Louis, Mo.; and Grinnell, Iowa. During the first two days of April they appeared at Peoria, Ill.; Knoxville, Iowa; Iowa City, Iowa; Aledo, Ill.; Tampico, Ill., and Lanesboro, Minn. From April 4 to April 6 they were reported from Fernwood, Ill.; Milwaukee, Wis.; Durand, Wis.; Hastings, Minn.; and Elk River, Minn. They reached Luck, Wis., April 24, and Shell River, Manitoba, May 1.

In the fall of 1885, at Elk River, Minn., the last was seen September 16; at River Falls, Wis., October 9; at Des Moines, Iowa, October 24; while at Lanesboro, Minn., near a rapid stream, which is very late in freezing, they were still present November 30.

391. Ceryle cabanisi (Tschud.). [383.] *Texas Kingfisher.*

As its name implies, this bird inhabits Texas, though the center of its distribution is in tropical America. Mr. Lloyd says he has found it in Nueces and Frio Cañons, in Edwards county, but not further north. Mr. Henry recorded it as a rare summer resident in Mason county, a few miles northeast of Edwards county. In April, 1878, its eggs were taken in Comal county, Tex., by Mr. W. H. Werner (Bull. Nutt. Ornith. Club, Vol. IV, 1879, pp. 79, 80). It is probably resident throughout its range.

392. Campephilus principalis (Linn.). [359.] *Ivory-billed Woodpecker.*

This is the largest Woodpecker of the Mississippi Valley, to the southern part of which it is limited, as far as our district is concerned. It is a resident wherever found. Ridgway says it was formerly resident in southern Illinois, but is now extinct in most parts of that State. At

Fayette, Mo., Mr. Lientz marks it as formerly breeding, but not known to do so at present. It is still found in northeastern Arkansas, being abundant at Newport, and not very wild or wary, and thence westward to Caddo, Ind. Ter., where a few were seen during the winter of 1883–'84 in the heaviest timber of the bottom lands, together with the Pileated Woodpecker. A few have been seen at Kansas City, Mo., during the past few winters, and it probably still breeds in that vicinity. Mr. Nehrling states that it is rare and very shy in the northern part of Harris county, and in Montgomery county, Tex.

393. Dryobates villosus (Linn.). [360.] *Hairy Woodpecker.*

The whole of the Mississippi Valley, except the Gulf States, is inhabited by this species.

393a. Dryobates villosus leucomelas (Bodd.). [360*a*.] *Northern Hairy Woodpecker.*

The northern representative of the preceding. Inhabits British America, coming south in winter to the northern border of the United States. Recorded by Mr. Seton (now Thompson) as a common resident in western Manitoba.

393b. Dryobates villosus audubonii (Swains.). [360, part.] *Southern Hairy Woodpecker.*

An inhabitant of the South Atlantic and Gulf States.

393c. Dryobates villosus harrisii (Aud.). [360*b*.] *Harris's Woodpecker.*

This is the western form of the Hairy Woodpecker, occurring from the Rocky mountains to the Pacific. Dr. Agersborg says it is common and resident at Vermillion, Dak., thus bringing it within our district.

394. Dryobates pubescens (Linn.). [361.] *Downy Woodpecker.*

Like the Hairy Woodpecker, this species is resident in Manitoba and over the whole of the Mississippi Valley, but is a little more given to changing its feeding grounds. It has no regular migration, but, like all the non-migratory Woodpeckers, it roves around during the winter in search of food. This causes it to disappear at some places in the winter, and when it returns again it is supposed by the observers to have been regularly migrating, whereas it may have been north, east, south, or west; it may have been in the next county, or it may have wandered a hundred miles or more away. It is rare in central Texas, where one was shot in January, 1883, on the Middle Concho river (Lloyd).

394a. Dryobates pubescens gairdnerii (Aud.). [361*a*.] *Gairdner's Woodpecker.*

A western Woodpecker; rare along the northern half of the western border of our district. Mr. Allen found it along the Missouri in central Dakota, and thence westward, but not common.

395. Dryobates borealis (Vieill.). [362.] *Red-cockaded Woodpecker.*

A bird of the southern swamps. The most northern record received from the observers came from Newport, Ark., where it has been found several times in the pine timber. Near Houston, in eastern Texas, it is not rare (Nehrling). It is resident throughout its range.

396. Dryobates scalaris bairdi (Sclater). [363.] *Texas Woodpecker.*

Resident in Texas; noted from San Angelo as very abundant, breeding from April 10 to May 15, where clutches of four, five, six, and eight eggs were taken. Common also in eastern Texas (Nehrling) and in the valley of the lower Rio Grande (Sennett & Merrill).

400. Picoides arcticus (Swains.). [367.] *Arctic Three-toed Woodpecker.*

Resident in Manitoba and northern Minnesota. This is one of the migratory Woodpeckers, but its movements are not extensive. In the Mississippi Valley these movements are limited to a migration from its summer home in British America to the United States, where it remains during the winter, returning in the spring. Even in winter it is more abundant in Manitoba than in summer. Individuals have been known to occur in northern Illinois, but are seldom seen south of latitude 40°. They were reported by Vernon Bailey from Elk River, Minn., and some years ago I met them at White Earth, Minn., and had the pleasure of ascertaining that they nested in that State.*

402. Sphyrapicus varius (Linn.). [369.] *Yellow-bellied Woodpecker.*

A common summer resident in Manitoba and the northern part of the Mississippi Valley. This is one of the three regularly migratory Woodpeckers which inhabit the Mississippi Valley, and its migrations are more extended than are those of either of the others. The extreme limits of its range are separated by 3,000 miles, for it has been recorded from Guatemala to Greenland, but of course no single individual has traversed the whole of this distance. Still, since it seldom breeds south of latitude 42°, the most unambitious has many a long mile to travel. In the winter of 1883–'84 it was found as far north as Danville, in Illinois, and Morning Sun, in Iowa, but was rare at both places. From these points southward for 300 miles it is a rare winter visitant, but its regular winter home is south of latitude 37°. Even at Caddo, Ind. Ter. (lat. 34° 11′), it was not common, and its quietness and retired habits made it seem even less numerous. In the spring of 1884, migration commenced at Gainesville, Tex. (lat. 33° 36′), March 6, when the bulk of the winter residents departed; the last followed on the 11th. Migrants had become quite numerous at Pierce City, Mo. (lat. 36° 56′), by March 19, and this wave brought the first of the migrants to Saint Louis March 26. An accidental bird was seen at Chicago February 16, but the regular advance did not reach there until about the 8th of April. By April 10 they had reached Lanesboro, Minn. (lat. 43° 43′). They were seen at River Falls, Wis. (lat. 44° 45′), April 12, and two days later at Elk River, Minn. (lat. 45° 25′). The bulk rarely falls more than three or four days behind the van, and the last one does not lag far in the rear. Though rarely breeding south of latitude 42°, it nests regularly but a short distance farther north. It has been known to breed at La Porte, Iowa (lat. 42° 18′), and Mr. Munroe states that between July 4 and 10, 1884, he shot several in the hills 50 miles west of Newport, Ark., where he saw others in June and August, though neither nests nor young birds were found. At Danville, Ill., they remained all summer, and two trees were found which contained their nests. No attempt was made to secure their eggs.

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*[In July, 1877, Dr. Thomas S. Roberts found this Woodpecker breeding in Carlton county, Minn. (Bull. Nutt. Ornith. Club, vol. IV, 1879, p. 154).—C. H. M.]

In the fall of 1884, at Des Moines, Iowa, the Yellow-bellied Woodpecker was last seen September 24. At Shawneetown, Ill. (lat. 37° 43′) a few individuals remained during the winter of 1884-'85.

In the spring of 1885 the notes of its northward movement were quite regular. It appeared at Saint Louis and Mount Carmel, Mo., March 31; Chicago, Ill., April 1; Des Moines, Iowa, April 13; Newton, Iowa, April 17; Green Bay, Wis. (two observers), April 19; Lanesboro, Minn., April 21; River Falls, Wis., April 21; Elk River, Minn., April 26; and Shell River, Manitoba, May 3. In the fall of 1885 the last at both Fernwood, Ill., and Des Moines, Iowa, were seen October 3. At Saint Louis, Mo., the first arrived September 16; there was an increase September 24, and the bulk arrived October 9. The first at Gainesville, Tex., was seen October 9.

402a. Sphyrapicus varius nuchalis Baird. [369*a*]. *Red-naped Sapsucker.*

Inhabits the Rocky Mountain region of the United States, south into Mexico. It was taken by Colonel Goss at Wallace, Kans., October 12, 1883, this being the first record for that State and probably for our district. It has since been taken by Mr. Lloyd, at Fort Davis, Tex., where it is a rare winter resident.

404. Sphyrapicus thyroideus (Cass.). [370.] *Williamson's Sapsucker; Black-breasted Woodpecker.*

The only Mississippi Valley record of this species was received from Mr. William Lloyd, who noted it as an irregular winter visitant in Concho and Tom Green Counties, Tex., where it was tolerably common in the winter of 1883-'84. Mr. Lloyd found it on the North Concho, and also in Nueces Cañon, in Uvalde County.

405. Ceophlœus pileatus (Linn.). [371.] *Pileated Woodpecker.*

Resident in Manitoba and over all the Mississippi Valley wherever there is heavy timber. Reported by many observers.

406. Melanerpes erythrocephalus (Linn.). [375.] *Red-headed Woodpecker.*

A tolerably common summer resident in Manitoba and throughout the Mississippi Valley. Mr. Allen found it abundant in west-central Dakota in the summer of 1873. Its winter range west of the Mississippi is much restricted. At Saint Louis it is a rare winter resident; a short distance south, in Illinois, Mr. Ridgway says that it is excessively abundant in the bottom-lands during the winter. Passing westward to Pierce City, Mo., it was recorded as a rare winter resident in the bottom-lands. Still farther southwest, at Caddo, Ind. Ter., it is so rare a bird in winter that none of the local hunters thought one could be found. A few were seen, however, one at a time, all through December and January. Near Houston, in eastern Texas, it is an abundant resident (Nehrling). Throughout the greater part of its range it is a more or less regular migrant, its movements depending largely, if not wholly, on the food supply. Though capable of withstanding great cold when food is plenty (as for instance when it spends the winter in northeastern New York),* it seems to much prefer a warm climate, and when in the south waits until the weather is settled before attempting the northward journey. In the spring of 1884, in the belt between latitude 39° and latitude 39° 30′ in Illinois and eastern Missouri, their winter numbers began to be increased about the middle of March, and in Illinois the first had advanced to Chicago by the end of the month. No such advance took place in Iowa. Not a Red-head was reported in the State before April 26, nor any further advance in Illinois until after May 1. By the 1st of May the advance in Iowa was at latitude 41° 38′, and by May 6 those on the western side of the Mississippi had overtaken those on the eastern side, and they were both together in Wisconsin and Minnesota at latitude 43° 43′. Four days later they had passed to West Depere, Wis. (latitude 44° 26′); May 15 they were reported from Minneapolis and Green Bay; May 19 from Elk River, Minn. (latitude 45° 25′), and the last day of the month they had penetrated to Oak Point, Manitoba (latitude 50° 30′). Near the Mississippi River the bulk may be looked for about ten or fourteen days after the arrival of the first.

In the fall of 1884 the bulk left Williamstown, Iowa, August 27, and Des Moines, Iowa, September 18. At Des Moines the last was reported September 19; and at Mount Carmel, Mo., November 11. At Shawneetown, Ill., it remained through the winter of 1884–'85, and a single pair wintered at Saint Louis, Mo. Several early records from points farther north indicate that the individuals seen had wintered not far from the localities whence they were reported. These records are: Fayette, Mo., March 10; Sioux City, Iowa, March 11; Durand, Wis., March 15; Keokuk, Iowa, March 22; and Lake City, Minn., April 13.

In regular migration in the spring of 1885 it was first noted from Saint Louis, Mo., April 16; an increase was observed April 21; it continued arriving slowly from April 22 to 26, and the bulk came from April 28 to May 1. As the rest of the notes for 1885 can not be arranged systematically they will be given in full. The "firsts" recorded were as follows: Ferry, Iowa, April 24; Williamstown, Iowa, and Lake Mills, Wis., April 25; Delavan, Wis., April 29; Fayette, Mo., and Grinnell, Iowa, April 30; Paris, Ill., Manhattan, Kans., and Milwaukee, Wis.,

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* Merriam, Bull. Nutt. Ornith. Club, Vol. III, 1878, pp. 124-125.

May 1; Fernwood, Ill., and Des Moines, Iowa, May 2; Rockford, Ill., May 3; Luck, Wis., May 4; Aledo, Ill., and Ripon, Wis., May 5; Batavia, Ill., and Rochester, Minn., May 10; New Cassel, Wis., May 13; Leeds Centre, Wis., and Waukon, Iowa, May 14; Ames, Iowa, and Elk River, Minn., May 15; River Falls, Wis., May 18. It was given as a very rare visitant near San Angelo, Tex., where one was shot in August, 1885. In the fall of 1885 the last at Elk River, Minn., was seen September 4; at River Falls, Wis., September 21; at Grinnell, Iowa, August 15; at Des Moines, Iowa, September 15; at Fernwood, Ill., September 26; and at Iowa City, Iowa, October 30. Many migrants were seen at Saint Louis, Mo., October 10, all going southeast.

408. **Melanerpes torquatus** (Wils.). [376.] *Lewis's Woodpecker.*

A western Woodpecker, rare in our district. It has been taken by Dr. Watson at Ellis, Kans., and is known to breed in the Black Hills of Dakota (Grinnell). In the fall of 1884 Mr. Lloyd added this species to the list of Texas birds. He says: "Two were here (near San Angelo) before Christmas, and four arrived after our bad Christmas norther." More recently Mr. Lloyd records it as a "winter visitor," tolerably common on Spring Creek.

409. **Melanerpes carolinus** (Linn.). [372.] *Red-bellied Woodpecker.*

South of latitude 35° in the Mississippi Valley the Red-bellied Woodpecker is an abundant resident; north of this latitude for about five degrees it is less common, but still resident; and from latitude 40° northward to the limit of its range it is more or less migratory. In Kansas it is an abundant resident (Goss). Mr. Peck writes from La Porte, Iowa (latitude 42° 18′), that a few breed, but that most of them migrate northward. Where they go is a mystery. None of the stations in northern Iowa reported the bird, and it is unknown in Minnesota. Years ago Mr. Trippe made the same observation, namely, that "during the winter it is exceedingly abundant in southern Iowa, from which section great numbers migrate on the approach of spring." In Nebraska, Prof. Aughey says they are rarely seen north of the Platte, and Dr. Agersborg states that it is a rare summer visitor in southeastern Dakota. In northern Illinois, Mr. Kline marks it as a rare resident, and I have found it a rare summer bird at Ripon, Wis., but am not aware of its occurrence there in winter. As Ripon is north of the southern boundary of Minnesota, it is probable the species will yet be found in that State. Dr. Hoy reported it from Racine, Wis., March 26, 1884. In central Texas, on the main Concho River, it is tolerably common in winter (Lloyd).

410. **Melanerpes aurifrons** (Wagl.). [373.] *Golden-fronted Woodpecker.*

Occurs in our district in Texas only. In the valley of the Lower Rio Grande it is an abundant resident. It was reported from Tom Green and Concho Counties, by Mr. Lloyd, who states that it is an abundant resident. He says it occurs west to the Castle Mountains, near Pecos

River, and north to the Texas and Pacific Railway. Mr. Brown found it at Boerne.

412. Colaptes auratus (Linn.). [378.] *Flicker; Yellow-shafted Flicker.*

A common summer resident in Manitoba and most of the Mississippi Valley east of the Plains; being replaced, in the west, by the following species. Along the eastern edge of the Plains all sorts of intermediate phases occur.

Few birds are better known or possess more local names than the present species. Yellow-hammer and Flicker are the names by which it has been most frequently reported, and the two in about equal proportion. Its winter home in 1883-'84 was somewhat farther south than usual. At Manhattan, Kans., large flocks remained all winter, but they were not reported from the rest of the State. In Missouri none wintered at St. Louis, nor were they mentioned from any station in the State before March. In Illinois they were found in the extreme southern part only. The species was a full degree, and in most places two degrees, south of its ordinary limit. Although mixing with *C. cafer* and the variety formerly known as *Colaptes auratus hybridus* in the western part on the Plains, yet true *auratus* is found throughout the Mississippi Valley, even to southwestern Texas, where it was noted from San Angelo in the winter of 1883-'84. Its spring migration begins early, being but little behind that of the Robin, and the bulk of these two species usually moves together. In 1884 a few individuals were influenced by the warm weather of the last of January and moved slightly, but no real movement took place until the second week in March. On March 10 and 11 they appeared at Saint Louis and Glasgow, Mo. (latitude 39° 14′). The Flicker, like the Red-headed Woodpecker, migrates faster on the east than on the west side of the Mississippi River. The record of its arrival on the east side is as follows: In Illinois it reached latitude 39° 43′ March 19; March 20 and 21 it reached latitude 41° 36′ and 41° 51′; March 24, latitude 41° 58′; March 26, latitude 43° in Wisconsin, and March 29, latitude 44° 26′. West of the Mississippi it had moved to latitude 41° 40′ in Iowa by March 26; to latitude 44° 26′ in Minnesota by March 28, and March 31 it was seen at latitude 45° and 45° 25′ in Minnesota, having thus overtaken those in Wisconsin. Farther west the dates were still later. The first was seen at Ellis, Kans., March 21; at Linwood, Nebr. (latitude 41° 22′), April 2; at Argusville, Dak. (latitude 47° 08′), April 16; and at Larimore (latitude 47° 52′) April 21. At Portage La Prairie, Manitoba, the first was seen also April 21, which makes the record irregular as compared with that from Dakota, but regular when compared with the notes from the region around the headwaters of the Mississippi. The bulk ordinarily appears from three to six days behind the first.

The variety formerly known as the Hybrid Flicker (*Colaptes auratus hybridus*) [378 *a*], consisting of those specimens which are intermediate between *auratus* and *cafer*, has been found along the western edge of our district, running into *cafer* in the west and *auratus* in the east. It was noted in the winter of 1883–'84 from Caddo, Ind. Ter., and a second time from Texas, this record being from San Angelo. At Caddo it was first seen January 11, and was more or less common during the rest of the winter, though outnumbered by both *auratus* and *cafer*. There is little to indicate that in its migration it differs from typical *auratus*.

In the fall of 1884 the bulk had departed from Elk River, Minn., before September 27. At Mount Carmel, Mo., a half dozen were seen December 10. During the winter of 1884–'85 the range of the Flicker extended somewhat farther north than in the winter of 1883–'84. More than the usual number wintered at Saint Louis, where none were seen the previous winter. It was seen also during the winter at Glasgow, Mo., Keokuk, Iowa, Fayette, Mo., and Griggsville, Ill. At La Porte City, Iowa, it was more common during the winter of 1884–'85 than ever before; while at Aledo, Ill., this was the only winter for many years when none were seen.

In the spring of 1885 the northward movement of the Yellow-shafted Flicker was later than in 1884. No positive records of migration were made until March 29 and 30, when the bulk reached Saint Louis, and the first were noted at Aledo, Ill., Ferry, Iowa, and Linwood, Nebr. Its progress for a few days seems to have been more rapid along the Mississippi River than farther east or west. By April 5 it had been noted from Mount Pleasant, Iowa; Grinnell, Iowa; Ames, Iowa; Clinton, Wis.; Lake Mills, Wis.; Lanesboro, Minn., and Rochester, Minn. April 7 it was reported from Chicago, Ill.; Delavan, Wis., and Lake City, Minn. Then, April 18 to 20 the line of the van reached the same parallel in Wisconsin and Minnesota, the first being seen at Milwaukee, Wis.; New Cassel, Wis.; Green Bay, Wis. (two observers); Durand, Wis.; River Falls, Wis.; Minneapolis, Minn. (two observers), and Heron Lake, Minn. It was seen at Oak Point, Manitoba, April 21.

In the fall of 1885 the last was seen at Elk River, Minn., October 13; at River Falls, Wis., September 29; at Fernwood, Ill., October 31. The first migrant reached Fernwood September 12, and they were conspicuous at Saint Louis, Mo., September 22. At the latter place many were seen going south October 5, and two days later migration reached its height, although the last migrant was not seen until November 11. At Bonham, Tex., it was first seen October 4; was next seen three days later, and became common by the 15th.

413. Colaptes cafer (Gmel.). [378 *b.*] *Red-shafted Flicker.*

This is a species which occupies the United States from the Plains westward. It is found almost to the eastern boundary of Texas, Indian Territory, Kansas, and Nebraska, but in Dakota its eastern limit curves sharply westward, nearly the whole of that Territory being occupied by *Colaptes auratus*. There seems to be but little difference between the movements of this species and those of *C. auratus*, though it is probable that a greater percentage of *C. cafer* go farther north to breed. At Manhattan, Kans., it was recorded as merely a winter bird, arriving December 8, and it was seen occasionally through the winter. In the spring of 1884, at Manhattan, the bulk arrived from the south March 15, and April 1 the last was seen. At Caddo, Ind. Ter., it was not seen until January 11, but after that date was common during the rest of the winter. It was rare near town, staying in or near the bottom-land. I do not think it ever remained to breed. At San Angelo, Tex., it was also marked as merely a winter resident, not breeding. Considering the two species and the variety once known as *hybridus* as they occur together at Caddo, Ind. Ter., we find that *auratus* arrives early in the fall and is a common winter resident; few, if any, breed there. After *auratus* has practically completed its fall migration and settled down to winter numbers, *C. cafer* and *C. auratus hybridus* came in together, and during the coldest weather all three are found in about equal numbers in heavy timber land, though *C. cafer* perhaps is the most abundant. It has been said that it is impossible to distinguish one species from the other without shooting them, but *auratus* and *cafer* can be easily distinguished by the difference in their call notes.

416. Antrostomus carolinensis (Gmel.). [353.] *Chuck-will's-widow.*

This is the southern Whippoorwill, and though it occurs as far north as southern Illinois (in some counties of which it is quite common), it is more abundant in the Gulf States, from which came all the notes contributed by our observers. In the spring of 1884 it was seen at Rodney, Miss., April 14, and the next day at Yazoo City. April 13, it came to Gainesville, Tex. It was found breeding at Newport, Ark.

In the spring of 1885 the only records received on the migration of the Chuck-will's Widow were notes of its appearance at Gainesville Tex., April 10, and at San Antonio, Tex., April 28.

417. Antrostomus vociferus (Wils.). [354.] *Whippoorwill.*

A common summer resident in Manitoba and the Mississippi Valley east of the Plains. In the spring of 1884 it appeared in eastern Concho County, Tex., where it was a summer resident, March 6. As it was not seen at Rodney and Yazoo City, Miss., until the last two days of March, it constitutes an exception to the general rule that species arrive earliest near the Mississippi River. The notes on this species, though quite numerous, are peculiar in that they do not contain a single record of the arrival of bulk, departure of bulk, or last. East of the Mississippi the rest of the record, omitting irregular occurrences, is as follows: April 15 they reached latitude 33° 34′ in Mississippi and latitude 36° 31′ in Tennessee; April 27 they were recorded at latitude 40° 08′ in Illinois; April 29 at latitude 41° 10′ in Illinois, and the next day at Chicago, latitude 41° 51′. They reached latitude 41° 58′ in Illinois May 1; Milwaukee, Wis., latitude 43°, May 3, and Green Bay, Wis., latitude 44° 30′, May 14. West of the Mississippi the record began at Reeds, Mo., latitude 37° 08′, April 8, and was carried on by arrivals at latitude 38° 45′ in Missouri, and latitude 39° 12′ in Kansas, April 17; at latitude 41° 14′ in Iowa, April 23; latitude 41° 38′ in Iowa, April 25; latitude 44° 47′ in Minnesota, May 2; and May 3, at latitude 45° 05′ and 45° 25′ in Minnesota. May 10, it was reported at Frazee City, Minn., (latitude 46° 33′), by Miss Gertrude M. Lewis; and another early date came from Oak Point, Manitoba (latitude 50° 30′), where it was seen May 8, by Mr. A. T. Small. The records on this species cover a stretch of country about 1,400 miles in length, and the average rate of migration (whether taken from the records east or from those west of the Mississippi River) is twenty miles a day. The rarity of the Whippoorwill over the region of the Great Plains is seen from the fact that not a single record was received from Nebraska or Dakota.

In the fall of 1884 the last Whippoorwill was seen at Elk River, Minn., September 23; at Lanesboro, Minn., September 22; and at Grinnell, Iowa, October 10.

The notes on this species for the spring of 1885 can be arranged with ease, since nearly all of them belong to one wave. The first records were: Mason, Tex., March 27; Gainesville, Tex., April 6; Reeds, Mo., April 12. The wonderful warm wave which occurred in the Mississippi Valley from April 19 to 24 induced the Whippoorwill to migrate over an immense stretch of country. During these days it was noted from Mount Carmel, Mo.; Peoria, Aledo, and Chicago, Ill.; Morning Sun, Ferry, Coralville, Iowa City, Newton, Grinnell, Ames, La Porte City, Williamstown, and Waukon, Iowa; Leeds Centre, Durand, River Falls, New Richmond, and Luck, Wis.; and Elk River, Minn. After such an extraordinary wave as the above it is natural that further advance would be long delayed, and no report came from any station north of Elk River, Minn., until the extreme limit of the northern range was reached, at Oak Point, Manitoba, May 12. It was noticed in 1884 that the Whippoorwill was not reported from Nebraska and Dakota. In 1885 no reports come from these States nor from Kansas. In the fall of 1885 the last was seen at Mount Carmel, Mo., September 20.

418. Phalænoptilus nuttalli (Aud.). [355.] *Poor-will.*

The scarcity of the preceding species on the Plains has been mentioned. Its place there is taken by the present species, which is a rather common summer resident in Texas, Kansas, Nebraska, and Dakota, passing eastward, even to Grinnell, Iowa, where an accidental visitant was taken in 1880. In southeastern Dakota Dr. Agersborg recorded it as common, but gave no date for its arrival. In the spring of 1884 it was seen at Mason, Texas, April 8, and at Manhattan, Kans., May 6. It proceeds north to about latitude 48°, and winters near our southern border.

In the spring of 1885 the first Poor-will was noted at San Angelo, Tex., March 26. It arrived at Manhattan, Kans., April 15, but the next was not seen there until May 4. In the meantime it had been seen at Emporia, Kans., April 27.

Phalænoptilus nuttalli nitidus Brewster. [——.] *Frosted Poor-will.*

This handsome subspecies has been recently described by Mr. Wm. Brewster, from specimens taken on the Nueces River, in Texas (Auk. Vol. IV, No. 2, April, 1887, pp. 147–148).

419. Nyctidromus albicollis (Gmel.). [356.] *Parauque.*

A tropical American species, coming north to the valley of the Lower Rio Grande, in Texas, where it is a common summer resident (Sennett & Merrill).

420. Chordeiles virginianus (Gmel.). [357.] *Nighthawk.*

The Nighthawk winters south of the United States, and breeds throughout most of the Mississippi Valley east of the Plains, but principally in the northern portion, very few remaining in summer south of the parallel of thirty-seven degrees. It is a common summer resident in middle and eastern Kansas (Goss).

In the spring of 1884 the earliest date received of the appearance of the Nighthawk within our borders was April 20, when it was seen at Waverly, Miss. (latitude 33° 34′). Since it arrived at Oak Point, Manitoba (latitude 50° 30′), May 25, its average speed was very high, reaching 34 miles a day. A computation based on the same rate of speed indicates that the species reached the Gulf coast of Mississippi about April 14. The Nighthawk was recorded from latitude 39° in Missouri and Illinois April 29 and 30, and May 3 from latitude 39° 27′ and 40° 08′ in Illinois. May 6 and 8 it appeared in Illinois and Iowa, in the neighborhood of latitude 41° 30′, with a stray bird at latitude 43° 15′, and also at Manhattan, Kans. (latitude 39° 12′). May 12 and 13 found it at latitude 43° 43′ in Minnesota, and latitude 43° 06′ in Wisconsin, and May 16 and 17 carried it over all the country south of latitude 54° 25′. It reached Argusville, Dak. (latitude 47° 08′), May 23, and was noted from Oak Point, Manitoba (latitude 50° 30′), May 25.

In the fall of 1884 the last Nighthawk was seen at Williamstown, Iowa, August 26; at Des Moines, Iowa, September 15; at Mount Carmel, Mo., September 27. The bulk left Des Moines September 10, and Mount Carmel September 21. While the advance of this species in 1884 was quite regular, in 1885 there were unexplainable idiosyncracies. It reached the southern border of the United States the same day as in 1884, namely, April 14 (at Houma, La.). It was reported from San Antonio, southern Texas, April 15; from Corinth, Miss., April 22; Bonham, Tex., April 29; Saint Louis, Mo., April 30; and May 2, 3, and 4 from Reeds and Mount Carmel, Mo., Odin and Rockford, Ill., Keokuk, Iowa, and Ellsworth and Emporia, Kans. Thus far all the notes were somewhat regular, but four notes were contributed which certainly are extraordinary. They are: Grinnell, Iowa, first seen

April 21; next, April 22; common, April 26; Iowa City, Iowa, first seen April 22; Leeds Centre, Wis., first, April 21; next, April 24; Luck, Wis., first, April 28; next, April 30; common, May 11. The high character of the observers, and the commonness and unmistakability of the Nighthawk, render it hardly possible that there can be any mistakes in the observations, which by their very number substantiate one another. And it must be remembered in this connection that the temperature during the night of April 21 was high enough to inspire migration in any of the heat-loving species. At 11 p. m., April 21, the thermometer registered 62° F. at Saint Paul and 69° F. at Davenport. The next warm wave reached the Upper Mississippi Valley April 28. The rest of the notes are quite regular. The first Nighthawk reached Peoria, Ill., May 6; Aledo, Ill., May 11; and May 14, 15, and 16 the first was recorded from Unadilla, Nebr.; Des Moines, Iowa; Waukon, Iowa; Lake Mills, Wis.; Milwaukee, Wis.; New Cassel, Wis.; La Crosse, Wis.; Durand, Wis.; River Falls, Wis.; Rochester, Minn., and Elk River, Minn. May 19 it was reported from Heron Lake, Minn.; May 20 from Linwood, Nebr., and Huron, Dak.; May 23 from Argusville, Dak.; Menoken, Dak.; Two Rivers, Manitoba, and Oak Point, Manitoba, though at this last place it had been first noted May 19.

In the fall of 1885 the last was seen at Elk River, Minn., September 20; at River Falls, Wis., September 15; Lanesboro, Minn., September 18; Grinnell, Iowa, October 10; Iowa City, Iowa, September 20; and Fayette, Mo., September 19. The first was seen at Gainesville, Tex., October 6, and the last November 27. At Saint Louis, Mo., migration began August 17. Great movements were noted during the evenings of August 21 to 23, and again August 27. Fifty were seen going southeast at 5 p. m., September 15, and the last passed October 3.

420 *a*. Chordeiles virginianus henryi (Cass.). [357 *a*.] *Western Nighthawk.*

A common summer resident in western Manitoba and the Great Plains; common in middle and western Kansas (Goss). The records of this subspecies, which is the form inhabiting the dry western Plains, indicate quite a regular migration. In the spring of 1884 it was reported from Gainesville, Tex., April 29; Darlington, Ind. Ter., May 4; Ellsworth, Kans., May 9; Ellis, Kans., May 10; and Menoken, Dak., May 23. These records indicate that the species performed its northward migration in the spring of 1884 at the high rate of 34 miles a day for a distance of upwards of 900 miles. Few species exceed the present in the extent of its wanderings, its migrations extending nearly 4,000 miles—from Brazil to the Arctic regions. It is found as far east as Vermillion, in southeastern Dakota, where it is a common summer resident, and where the eastern Nighthawk occurs in migration only. In the spring of 1885 the only record received concerning the Western Nighthawk was its arrival at San Angelo, Tex., April 28. Mr. Lloyd says it probably breeds on the plains in Texas. Several specimens have been recorded from as far east as Waukegan, Ill. (Nelson).

421. Chordeiles texensis Lawr. [358.] *Texan Nighthawk.*

A southern species, occurring from Texas to southern California and southward. In 1884 it arrived at Mason, Tex., April 26. At San Angelo, Tex., five nests were found from May 14 to May 29, each containing two eggs. In southeastern Texas (near Houston) it is a regular summer resident (Nehrling).

423. Chætura pelagica (Linn.). [351.] *Chimney Swift.*

A common summer resident in Manitoba and the Mississippi Valley. From its unknown winter home, somewhere south of the United States, the Chimney Swallow, in the spring of 1884, crossed our border in March, arriving at Rodney, Miss., March 13, but it was not noticed at Abbeville, La., which is on a prairie, until March 25. No records of it were received while it was performing the next 400 miles of its journey; but on April 14 it appeared all along the line of latitude 39° in Illinois and Missouri. April 20 it was reported from latitude 40°, and May 1 from several stations near latitude 41° 30′. On the same day it was also reported from Minneapolis, Minn., and Green Bay, Wis. These latter, however, were doubtless records of impetuous birds that had flown far ahead of their fellows, and the whole of the next week was required to distribute the species over the region they had crossed so hurriedly. The advance reached Portage La Prairie, Manitoba, May 17. An average of all the notes received indicates that the bulk traveled about one week in rear of the van.

In the fall of 1884 the last Chimney Swift was seen at Mount Carmel, Mo., October 5, while the bulk left September 21.

In the spring of 1885 the first Swift was noted at Houma, La., March 21. It probably reached that point some days before, since it arrived at Saint Louis, Mo., ten days later (March 31), and this distance of 700 miles is more than this species usually travels in that time. Six days elapsed after the first was seen at Saint Louis before it was observed at any other station, and then at two places on opposite sides of Saint Louis, and both much farther south, namely, Corinth, Miss., and Bonham, Tex. April 15 to 17 the bulk arrived at Saint Louis, and during the same period the first was noted from Shawneetown, Paris, and Griggsville, Ill. The next advance took place April 21 and 22, bringing the species to Emporia and Manhattan, Kans., Linwood, Nebr., Des Moines, Iowa, Griggsville, Ill., and Hennepin, Ill. At the following places in Iowa, in the same latitude, they were not seen until five days later: Coralville, Grinnell, and Ames. Then came a long rest, extending to May 13 and 14, when, with the returning warm weather, they appeared at Chicago, Ill., Delavan, Wis., Milwaukee, Wis., Stoughton, Wis., Lake Mills, Wis., River Falls, Wis., Lanesboro, Minn., and Elk River, Minn. Much attention was paid to the movements of this species at Saint Louis by Mr. Widmann, who counted the number which, at evening, entered a certain tall chimney that for years has been a favorite resting place. The whole record from Saint Louis is:

March 31, first came two small parties at 6 p. m.; April 1, one going north, two enter the chimney; April 4, four enter; April 5, seven; April 15, thirty; April 17, one hundred and thirty; April 20, one hundred and fifty; April 25, two hundred and six; May 8, four hundred; May 12, one hundred and forty; May 15, fifty; May 16, transients are gone and summer sojourners are building.

In the fall of 1885 the last was reported from Elk River, Minn., September 7; Grinnell, Iowa, September 10; Iowa City, Iowa, September 12; Mount Carmel, Mo., September 20; Saint Louis, Mo., October 17; Shawneetown, Ill., October 19; and Bonham, Tex., September 26.

The full fall record from Saint Louis is as follows:

Date.	Movement.	Date.	Movement.
Aug. 17	311 enter chimney.	Oct. 3	100 enter chimney.
“ 19	600 enter chimney.	“ 7	Many in air.
“ 26	600 enter chimney.	“ 11	175 enter chimney.
“ 29	600 enter chimney.	“ 15	175 enter chimney.
“ 30	400 enter chimney.	“ 16	88 enter chimney.
Sept. 9	At 11 a. m. large troops go south.	“ 17	Last seen.
“ 18	300 enter chimney.		

425. Micropus melanoleucus (Baird). [349.] *White-throated Swift.*

A western species, taken once in Texas by Heermann (B. B. & R. Land Birds, Vol. II, p. 425).

428. Trochilus colubris Linn. [335.] *Ruby-throated Hummingbird.*

Breeds from Manitoba to the Gulf of Mexico. Breeds commonly as far west as Tom Green County, Tex. It is not probable that the Ruby-throat is ever found in the United States in winter. A queried reference from Florida has been received, and Mr. Bibbins, of Mermenton, La., states that he thinks he saw one at that place the last of January or first of February, 1884. In the spring of 1884 the Hummingbird appears to have entered the United States during the last week in March, when it was seen at Rodney, Miss., and Mason, Tex. April 3 and 4 it was reported from Yazoo City and Waverly, Miss., after which, excepting an irregular occurrence at Danville, Ill., April 28, nothing more was heard of it until the van reached Saint Louis, May 5. May 13 it had moved to latitude 43° in Wisconsin, and 43° 15′ in Iowa. May 18 it was reported from the most northern stations of Wisconsin, and in Minnesota up to latitude 46° 33′. May 25 it was seen at Oak Point, Manitoba. And even here these tiny creatures, some of whom spent the winter in Brazil, had another five hundred miles to go before reaching the northern limit of their range.

In the fall of 1884 the last was seen at Williamstown, Iowa, August 23, and at Des Moines, Iowa, September 27. The last left Mount Carmel, Mo., October 5, although the bulk left September 15.

In the spring of 1885 the first Ruby-throated Hummingbird was recorded from San Antonio, Tex., April 1. This was followed by its arrival at Bonham, Tex., April 7; Shawneetown, Ill., April 20; Fayette, Mo., April 25; and Odin, Ill., April 27. The rest of the notes were irregular. The first at Iowa City, Iowa, was noted May 1; at Pierce

City, Mo., May 2; at Paris, Ill., May 3; at Grinnell, Iowa, Saint Louis, Mo., and Hennepin, Ill., May 4; at Peoria, Ill., May 6; at Waukon, Iowa, May 13; at Coleta, Ill., and La Porte City, Iowa, May 15; at Keokuk, Iowa, Lake Mills, Wis., and Lanesboro, Minn., May 16; at Rockford, Ill., and Elk River, Minn., May 17; at Chicago, Ill., New Cassel and Luck, Wis., May 19 and 20. The arrival of the first at Shell River, Manitoba, was noted June 3.

In the fall of 1885 the last was reported from Lanesboro, Minn., September 28; Grinnell, Iowa, September 16; Iowa City, Iowa, August 11; Fayette, Mo., October 10; and Mount Carmel, Mo., August 2. The last female was reported from Bonham, Tex., October 16, while the males had left some time in August. At Saint Louis, Mo., they were numerous September 26; the bulk left September 29, and the last was seen October 11.

429. Trochilus alexandri Bourc. and Muls. [336.] *Black-chinned Hummingbird.*

This western Hummer comes east to central Texas, where it was reported to be a common summer resident in Mason, Concho, and Tom Green Counties. In 1878 it was taken in Gillispie and San Saba Counties, Tex., by Mr. Ragsdale (Bull. Nutt. Ornith. Club, Vol. IV, 1879, p. 60). And a single male was killed by Mr. N. C. Brown at Boerne, Tex., April 5, 1883. At San Angelo, in the spring of 1884, it was not observed till April 16, but since its nest and two eggs were found there four days later (April 20) the species must have been present for some time before it was noticed.

In the spring of 1885 it was reported as arriving at San Angelo April 2; at San Antonio, April 7; and at Mason, April 11. At San Antonio a nest with two eggs was found April 28, and at San Angelo a nest with five young, May 13.

432. Trochilus platycercus Swains. [339.] *Broad-tailed Hummingbird.*

A Rocky Mountain Hummer, migrating south to Guatemala in winter. It was taken at El Paso, Tex., by Mr. J. H. Clark, in 1851 (B. B. & R. Land Birds, Vol. II, p. 463).

435. Trochilus heloisa (Less. & DeLatt.). [342.] *Heloise's Hummingbird.*

This species inhabits eastern Mexico and southern Texas. One specimen (♀) was taken at El Paso by Mr. Clark.

438. Amazilia fuscicaudata (Fraser). [345.] *Rieffer's Hummingbird.*

An inhabitant of Central America and eastern Mexico, coming north to the valley of the Lower Rio Grande, in Texas, where it was taken by Dr. Merrill.

439. Amazilia cerviniventris Gould. [346.] *Buff-bellied Hummingbird.*

An inhabitant of eastern Mexico, coming north to the valley of the Lower Rio Grande, in Texas, where Dr. J. C. Merrill found it a common summer resident.

442. Milvulus tyrannus (Linn.). [302.] *Fork-tailed Flycatcher.*

A tropical American species, accidental in the United States. Recorded by Audubon from Mississippi and Kentucky.

443. Milvulus forficatus (Gmel.). [301.] *Scissor-tailed Flycatcher.*

The true home of the "Texas Bird of Paradise" is from Texas to Central America. In summer it occurs regularly in Indian Territory and Kansas. In southern Kansas it is a tolerably common summer resident (Goss). Accidental stragglers have been recorded from as far north as Manitoba and Hudson Bay. In the spring of 1884 the first arrivals spread over the whole of the northern part of Texas during the last week of March. In Indian Territory they appeared at Caddo April 11 and at Darlington April 9. The bulk reached Eagle Pass, Tex., April 1, and three days later they were numerous at San Angelo, where they were breeding from May 6 to July 16. Clutches of four, five, and six eggs were found.

In the fall of 1884 a flock of transient Scissor-tailed Flycatchers was seen at San Angelo October 1. The last was seen there October 6. At Portage la Prairie, Manitoba, Mr. Nash found one "lying dead on the prairie" in October.

In the spring of 1885 none but Texas observers reported its arrival. It reached San Angelo March 14; Bonham March 28, and Gainesville March 31. It was noted also at Eagle Pass, San Antonio, and Mason. In the fall of 1885 the last was seen at Bonham October 5, and at Mason October 11.

444. Tyrannus tyrannus (Linn.). [304.] *Kingbird.*

A common summer resident throughout Manitoba and the Mississippi Valley. Even as far south as Houston, Tex., it breeds abundantly; but in the valley of the Lower Rio Grande it is a migrant only (Sennett & Merrill). At Brown's Valley, on the border between Minnesota and Dakota, it is so abundant that Roberts and Benner found twenty-five nests in one day (June 17, 1879), "all containing full sets of perfectly fresh eggs." (Bull. Nutt. Ornith. Club, Vol. V, 1880, p. 15.)

This species will be treated with reference to the influence which the atmospheric warm and cold waves had upon its movements. In studying the weather reports of the Signal Service it is found that a succession of cold and warm waves pass over the Mississippi Valley. They begin in the northwest and pass eastward and southward. This is true of the warm waves as well as the cold. The common idea that a warm wave begins in the south and passes northward is wrong; it begins in the north and passes southward. For example, on the night of May 15, 1884, a warm wave began at Custer, in the Rocky Mountains. At 11 p. m. the temperature was 70° Fahr., while at Memphis, Tenn., several hundred miles farther south and east, it was seven degrees colder (the mercury standing at 63°). This warm wave reached the Missouri River at Yankton and Omaha on the night of May 16, the Mississippi at Keokuk and St. Louis May 17, and by the next night it had extended to Cairo and Memphis. The maximum heat did not reach Vicksburg until the night of May 19. Thus this warm wave was four days in passing from the Rocky Mountains to Vicksburg. Before it had reached the Gulf States another cold wave had already started in the northwest. May 17, at Custer, Mont., the temperature was reduced to 53°. This cold wave, also passing south and east, reached Vicksburg May 20, the next night after the warm wave. In this way waves are constantly passing, and their influence on the migration of birds is very marked.

The Signal Service reports show that a warm wave culminated in the Lower Mississippi region on the night of March 30. The next day the first Kingbird noted in the spring of 1884 was seen at Rodney, Miss., (latitude 31° 52′). (It was reported that a few remained all winter at latitude 29° 57′ in Louisiana, as indeed they do throughout most of the Gulf States.) For the next ten days there was no general or widespread atmospheric wave. The northern half of the Mississippi Valley was visited by short snow-storms followed by still shorter periods of sunshine, while the weather in the southern part was of an indeterminate character. During this period, and after a night when the temperature was scarcely above freezing, the first Kingbird was noted from latitude 37° 08′ in Missouri. There is no reason for challenging the record, for in so well-known a bird there is little chance of erroneous identification. But the probability is that the bird really arrived the night before, when the temperature was nearly fifteen degrees warmer, and escaped detection. However that may be, it is evident that very little movement took place until the advent of the warm wave which started in the Rocky Mountains on the 12th of April and was very pronounced in the Lower Mississippi Valley during the nights of the 13th and the 15th, the temperature being 29 degrees warmer than a few nights before. This renewed the advance and brought the first Kingbirds to latitude 33° 34′ in Mississippi on the 15th, and to latitude 33° 36′ in Texas on the 16th. After a decided but short cold wave another warm wave passed over most of the Mississippi Valley on the night of April 17. It brought three males to Saint Louis, and the next day the bulk was reported from latitude 37° 08′ in Missouri. A few days later two notes were received from Illinois, just opposite Saint Louis. It may be that the birds came during the slight rise of temperature during the night of April 21, but it is more probable that they came on the night of the 17th and were not noticed until later. The next note in order of latitude is that from latitude 36° 56′ in Missouri, where the first was not recorded till April 25; but since a station in latitude 37° 08′ in Missouri, only a few miles distant, had previously reported both the first and bulk, it may be considered that the species was accidentally overlooked until long after it had arrived.

On April 25 a warm wave was at its height at Yankton and Omaha, arriving at Saint Louis the next day. This wave was the culmination of six days of constantly increasing warmth, and started the birds before it had reached its maximum. April 25, first arrivals were reported from latitude 41° 22′ in Nebraska, and April 26 an increase of summer residents, with the first flock of transients, was recorded at Saint Louis—at both places the day before the maximum of temperature. The night of the maximum (April 27) brought "firsts" to latitude 39° 43′ and latitude 40° 08′ in Illinois. A record was made at latitude 42° 16′ in Illinois on April 28, but as this was the day after a quite pronounced polar wave it is probable that the birds came the day before with the maxi. mum wave, and had escaped observation. The same remark applies to two records from latitude 40° 47′ and 40° 53′, April 28 and 29, which probably belong to April 26. The largest wave of the season began at Custer, Mont., April 28, passed Yankton and Saint Paul, and extended down the Mississippi to Saint Louis on the 29th, and reached the Lower Mississippi Valley on the 30th. As in the case of the previous wave, a slight bird movement took place the day before, bringing the first Kingbird to latitude 39° 14′ in Missouri, the bulk to latitude 39° 43′ in Illinois, and flocks of transients to latitude 38° 40′ in Missouri. But the next night witnessed the grand movement, which carried the species to latitude 41° 05′, 41° 26′, 41° 38′, 41° 40′, and 42° 37′ in Iowa, and latitude 39° 19′, 41° 36′, 41° 46′, 41° 58′, and 42° 37′ in Illinois. Hence it appears that between darkness and daylight there was a solid advance of Kingbirds over 200 miles of territory. Who shall say how many, many thousand were winging their way northward through the silent watches of that night? The notes of May 1 from latitude 41° 14′ in Iowa undoubtedly also belong to this wave. The night of May 1 was cold throughout the northern half of the Mississippi Valley, and was followed two days later by a warmer period, which marked another advance of Kingbirds to latitude 43° 06′. In this wave there was no such uniformity of movement as in the preceding. Indeed, out of the seven notes which have been apportioned to it, only two hit the maximum exactly; but considering them all to pertain to this wave, the advance is found to be at latitude 43° and 43° 06′ in Wisconsin, and latitude 43° 43′ in Minnesota, with the bulk at latitude 39° 12′ in Illinois and latitude 41° 14′ in Iowa. The culmination of the next wave extended from May 8 in the northwest to May 10 in the southeast. During the five days of preparation for this wave there were no notes. On the day preceding, the bulk arrived at latitude 42° 56′ in Dakota; the first at latitude 44° 22′ in Wisconsin and at latitude 45° in Minnesota, while on the day of the maximum "firsts" were recorded at latitude 43° 43′ and 44° 30′ in Wisconsin, latitude 44° 32′ in Minnesota, latitude 38° 55′ in Kansas, and latitude 47° 08′ in Dakota, with new arrivals of bulk at latitude 43° 06′ in Wisconsin and 41° 36′ in Iowa. Thus there was nearly as much real advance during these nights as during the last wave of April, the difference being that the April wave spread over all the stations during the same night, while the present wave occupied two nights. For the next three days there were six notes from the Upper Mississippi Valley, which probably belong to this wave, though the next two nights after the maximum were also warm and the birds very likely did some migrating. These six do not indicate any advance beyond previous records; but are the filling in from stations in the rear which had not before reported.

Another wave occurred on the night of May 17, but all the notes received on Kingbirds were made the previous day, which was also warm. These records mark the arrival of the bulk at latitude 43° in Wisconsin, and of the first at latitude 46° 33′ in Minnesota, while—and the fact is significant—it marked, as it should, the last transients seen at Saint Louis, for certainly all lasts should be seen just before the maximum of a warm wave.

But few waves remain in which the Kingbird is concerned. One on May 20 brought the bulk to latitude 43° 48′ and 46° 33′ in Minnesota, and the first to latitude 46° 58′ in Dakota, and lastly, on June 3, the first appeared at Oak Point, Manitoba (latitude 50° 30′). To recapitulate, 76 observations were contributed on the movements of the Kingbird. Of these, 12 were made on the day before the maximum; 10 the day after the maximum; 9 exactly at the minimum, that is, when the polar wave was at its height; 4 are evidently mistakes in identification, and 8 occurred at intermediate times when there was no decided wave either cold or warm. This leaves 33 notes which agree exactly with the maximum of the warm waves. It is perfectly natural that when a warm period is gradually increasing the birds should be influenced by it before it reaches the maximum, so that the first 12 records spoken of may be considered correct. Omitting the four mistakes, 72 records remain, of which 11 per cent. are indeterminate, 28 per cent. do not agree with the waves, and 61 per cent. agree exactly.

Considering the lack of experience in noting migration on the part of most of the observers, this is a very creditable showing.

The average speed at which the Kingbird migrates has been calculated in the light of the above-mentioned cold and warm waves. It has been assumed that no movement took place during the nights of pronounced cold waves, and also that none occurred until at least the day before the maximum, with the exception of the indeterminate times on which there were notes. The record began at latitude 31° 52′ in Mississippi March 31, and ended at latitude 59° 30′ in Manitoba June 3. The species thus passed over 1,286 miles in sixty-four days, which gives an average of twenty miles a day. Subtracting the nights of no movement, but retaining all the nights on which there was any possibility of movement, we find that there were thirty-two nights on which migration might have taken place, which would give an average of forty miles a night. That the above estimate of the number of non-movement nights is not too high may be seen from the records at

Saint Louis, where there were only about twenty-seven nights from March 31 to June 3 on which migratory movements took place; and it is safe to assume that the favorable nights as far north as Minnesota would have been fewer than at Saint Louis. Hence it is probable that on no night during which Kingbirds moved did they go less than forty miles, while on the night of April 29 they traversed over two hundred miles, and on the nights of May 9 and 10 more than a hundred miles each night.

If each station had furnished a record (similar to that kept by Mr. Widmann at Saint Louis) of all the nights when decided bird movements took place, when slight movements took place, and when no movement occurred, the advance of the various species could be calculated with great accuracy, and a long step forward would have been made in our knowledge of the phenomena of migration.

In the fall of 1884 the bulk left Williamstown, Iowa, August 20, and the last was seen there August 28. At Des Moines, Iowa, the last was seen August 26.

In the spring of 1885 the earliest record of the presence of the Kingbird in the Mississippi Valley came from Houma, La., where it was seen March 19. At Gainesville, Tex., 4 degrees farther north, the first was seen April 10; at Reeds, Mo., April 13; Shawneetown, Ill., April 16, and Odin, Ill., April 19. April 19 was the date of the beginning of the most pronounced warm wave which occurred in the Mississippi Valley during the whole season of migration. The rising temperature was first felt at Saint Vincent, Minn., the evening of April 18, and reached the maximum at New Orleans, La., the night of April 22. Its intensity may be judged from the fact that at La Crosse, Wis., the temperature at 11 p. m., April 17, was 38°, while the next night it was 58°; at Keokuk the temperature rose from 42° on the 17th to 68° during the night of the 21st. Of course, this great rising temperature sent a large bird-wave northward. The Kingbird was prominent in this wave, traveling in company with the Whippoorwill, Brown Thrasher, and many others. Now it is a queer fact that, although this bird-wave was plainly noticed at every station in southern Iowa and central Illinois, yet each station reported a different set of birds out of the ten or a dozen well-known species which there is good reason to believe were then migrating together. Thus, for example, during spring migration in 1885 the three birds already mentioned, namely, the Kingbird, Brown Thrasher, and Whippoorwill, were all reported from the following thirteen stations: Griggsville, Aledo, and Hennepin, Ill., and Morning Sun, Ferry, Knoxville, Des Moines, Iowa City, Coralville, Newton, Grinnell, Ames, and La Porte City, Iowa. During the five days from April 19 to April 23 the Kingbird was reported from six of these stations, the Brown Thrasher from eleven, and the Whippoorwill from nine. One station reported the Brown Thrasher only, and another the Kingbird only. The Kingbird and Brown Thrasher, without the Whippoorwill, were reported by two stations; the other two without the Kingbird by six stations, and one station reported the Kingbird and Whippoorwill without the Brown Thrasher. At two stations all three were seen. Now what conclusions can be drawn from these facts? It is evident that the peculiarity of the records must be due to irregularity of migration or to irregular or incomplete observation, and it is probable that both causes affect the result. These records show also how necessary it is, in studying migration, to have notes from a large number of stations. The seven of the above mentioned stations which did not report the Kingbird by April 23 recorded its arrival the following number of days afterwards, namely, one, fourteen, nine, six, eight, four, and twenty days, respectively.

Returning again to the regular migration of the Kingbird, the records show that it was seen at Odin, Ill., April 19; the next day at Saint Louis and Glasgow, Mo.; April 21 at Mount Carmel, Mo., and Manhattan, Kans.; April 22 and 23 at Paris and Hennepin, Ill., and Ferry, Coralville, Knoxville, and La Porte City, Iowa.

Although this same warm wave carried the Whippoorwill and the Brown Thrasher a full hundred miles farther north than any of these stations, no further advance of the Kingbird was noted during the rest of the month. Its advance from the region where the last wave left it to latitude 45° seems to have taken place in two separate flights, about a week apart, both passing over the same country. And since the interval between these two flights was occupied by snow-storms and freezing weather, it may be inferred that the advance-guard of Kingbirds had encountered the cold wave, which delayed the arrival of any other detachments until the weather moderated. The stations visited by the scouts on May 4 and 5 were Batavia, Ill., Delavan, Wis. (where it was first seen May 1), Stoughton, Wis., Lake Mills, Wis., New Cassel, Wis., Rochester, Minn., Excelsior, Minn. (first seen May 2), and Minneapolis, Minn. The second detachment was noted from May 11 to 13 at Batavia, Ill. (common); Rockford, Ill. (common); Lake Mills, Wis. (bulk arrived); Leeds Centre, Wis. (first); Ripon, Wis. (first); River Falls, Wis. (first); Ames, Iowa (first); Williamstown, Iowa (first); Waukon, Iowa (first); Lanesboro, Minn. (first); Heron Lake, Minn. (first); Lake City, Minn. (first), and Huron, Dak. (first). The first at Elk River, Minn., was seen May 14; at New Richmond, Wis., May 15; at Menoken, Dak., May 17; Two Rivers, Manitoba, and Oak Point, Manitoba, May 21. The two notes from Nebraska (Unadilla April 27 and Linwood May 2) agreed very well with records from both Kansas and Dakota.

In the fall of 1885 the last Kingbird was reported from Elk River, Minn., September 1; Grinnell, Iowa, August 4; Saint Louis, Mo., August 18; Mount Carmel, Mo., September 17; and Bonham, Tex., October 17. In Concho and Tom Green Counties, Tex., it is a rather rare fall visitant.

445. Tyrannus dominicensis (Gmel.). [303.] *Gray Kingbird.*

The Gray Kingbird is a tropical species, a few coming north regularly to the Gulf States to breed.

446. Tyrannus melancholicus couchii (Baird). [305.] *Couch's Kingbird.*

A tropical American species, coming north to southern Texas. Its nest and eggs have been taken at Lomita Ranch, on the Lower Rio Grande (Sennett).

447. Tyrannus verticalis Say. [306.] *Arkansas Flycatcher; Western Kingbird.*

A western species occurring in the western row of States in our district. It was ascertained to breed in western Minnesota by Thomas S. Roberts and Franklin Benner, who found two of its nests in the Traverse Lake region in June, 1879 (Bull. Nutt. Ornith. Club, Vol. V, 1880, pp. 15–16). It is common in middle and western Kansas (Goss); has been taken in Texas, in Kansas as far east as Fort Hays, and in both southwestern and southeastern Nebraska; is a rare summer resident in southeastern Dakota; abundant in central Dakota, and has occurred accidentally in Iowa, the District of Columbia, Maine, New Jersey, and New York. In 1884 few notes were contributed relating to its movements during the spring migration. It was seen at San Angelo, Tex., and Vermillion, Dak., during the first week in May, and at Ellis, Kans., May 22.

In the spring of 1885 the first Arkansas Flycatcher was seen at San Angelo, Tex., May 6, the next May 8, and the last May 18.

448. Tyrannus vociferans Swains. [307.] *Cassin's Kingbird.*

A southwestern species, recorded from western Texas.

449. Pitangus derbianus (Kaup). [308.] *Mexican Pitangus; Derby Flycatcher.*

An inhabitant of tropical America, coming north to the Lower Rio Grande Valley, in Texas, where it was found by Mr. Sennett, who procured several specimens near Lomita ranch, above Hidalgo.

450. Myiozetetes texensis (Giraud). [309.] *Giraud's Flycatcher.*

An inhabitant of tropical America, coming north to Texas (Giraud). Giraud's type is in the U. S. National Museum.

452. Myiarchus crinitus (Linn.). [312]. *Great-crested Flycatcher.*

A common summer resident of the Mississippi Valley; rare as far north as Manitoba. Winters extralimitally, entering our district in April. In the spring of 1884 it was recorded at Gainesville, Tex., April 13; Manhattan, Kans., April 26, and Burlington, Iowa, April 27. About the same time it was observed at Pierce City, Mount Carmel, and Saint Louis, in Missouri. The three stations near the thirty-ninth parallel reported the arrival of the bulk about May 1. By May 3 the van had advanced to central Iowa (latitude 41° 36′ and 41° 38′), while on the 10th, at West Depere, Wis., Mr. S. W. Willard shot the first he had ever seen in that neighborhood. The species seldom goes farther north than this. In Minnesota it has been traced up to latitude 45° and possibly a little further, but at latitude 47° I never saw it. It breeds throughout its United States range. In the fall of 1884 the last Great-crested Flycatcher was seen at Des Moines, Iowa, August 26. At Mount Carmel, Mo., the bulk left August 15 and the last September 9. The last left San Angelo, Tex., September 27.

In the spring of 1885 the earliest record was from Gainesville, Tex., where the species was seen April 9. It appeared at Saint Louis, Mo., April 21; Paris, Ill., April 22; Mount Carmel, Mo., April 23; Manhattan, Kans., May 4; Des Moines, Iowa, May 5, and Elk River, Minn., May 21. In the fall of 1885 the last left Grinnell, Iowa, September 26, and Saint Louis, Mo., September 21.

In Concho and Tom Green Counties, Tex., it is a summer resident, and is particularly abundant in fall migration; and at Houston, in eastern Texas, it is also a common breeder.

453. Myiarchus mexicanus (Kaup). [311.] *Mexican Crested Flycatcher.*

But one record of this Mexican species was received. Mr. Atwater found it a summer resident at San Antonio, Tex., where it arrived about the 1st of April in 1884. This point probably is not far from the northern limit of its range. Previously it was not known north of the valley of the Lower Rio Grande, where it is abundant.

454. Myiarchus cinerascens Lawr. [313.] *Ash-throated Flycatcher.*

This western Flycatcher reaches our district in Texas, where it is a summer resident. In the spring of 1884 the first male arrived at San Angelo March 23, followed three days later by the female; April 7 both sexes were numerous. Three nests were found May 9, May 19, and June 9. They contained clutches of four, five, and five eggs, respectively. The last noted in 1883 was on August 30.

In the spring of 1885 the first Ash-throated Flycatcher came to Mason, Tex., April 5, where they were common by April 10. At San Angelo, Tex., the first was seen March 15. They appeared at Bonham, Tex., April 22, and were common April 26. In the fall of 1885, at Bonham, Tex., the last was seen October 17.

455. Myiarchus lawrenceii (Gir.). [314.] *Lawrence's Flycatcher.*

An inhabitant of eastern Mexico, coming north to the Lower Rio Grande Valley, in Texas.

456. Sayornis phœbe (Lath.). [315.] *Phœbe; Pewee.*

This familiar bird is a common summer resident in the Mississippi Valley. In eastern Texas, near Houston, it is common in winter from December till March, but none remain to breed (Nehrling). In the spring of 1884 fifty observers reported the date of its first appearance. At the different stations there were great differences in the number of individuals seen. At one station they were reported as common, while at another, not far distant, they may have been very rare. Mermenton, La., near the Gulf coast, was the only station reporting it to be a permanent resident. Farther west, at San Angelo, Tex., a single bird was taken February 1, 1882. A single bird appeared at Gainesville, Tex., as early as February 27, 1884. At Caddo, Ind. Ter., one was seen March 8, and eleven days later the first arrived at Saint Louis, Mo. These were several males and females, the advance guard of the scattered army that moved northward a few days later.

The appearance of the Pewee at any locality is usually an indication that it will breed there. I have never yet seen a transient visitor in migration, and the notes received from the different stations confirm my opinion that they do not linger along the way while migrating. Whether their flight is maintained for long distances at a very great height, or whether they stop for rest and food, I do not know, but I have never seen any arrive in spring whose breeding locality was not easily found. True, I have known a pair to appear for a few days during warm weather and then disappear for a fortnight during a cold snap. But later the same birds returned and nested under the eaves of the old barn. They may have sought the shelter of some near forest or ravine, or may even have gone southward for a time during the cold weather. From March 20 to March 28, 1884, the great wave of migration occurred. During those eight days the species spread throughout Illinois, Wisconsin, Minnesota, Iowa, and Missouri. There does not seem to have been any regularity in this advance. The birds seem to have left their winter homes and to have passed directly to their breeding stands, where nesting began within a few days. Thus, at Newton, Iowa (latitude 41° 42′), they were building March 28.

On the western line of migration there was more delay in the advance. Thus on March 29 the first was seen at Pierce City (latitude 36° 56′); April 2 the first appeared at Manhattan, Kans. (latitude 39° 12′). April 7 they became common at Gainesville, Tex.; three days later were common at Manhattan. April 5 they were first seen at Fridley, Minn. (latitude 45° 05′). The last record of arrival was from Oak Point, Manitoba (latitude 50° 30′), where they are rare and were first seen May 15.

In the fall of 1884 the last Phœbe left Des Moines, Iowa, September 24. The bulk left Mount Carmel, Mo., October 1, while the last was seen there October 10. At Gainesville, Tex., the first came October 27.

In the spring of 1885 about half of the notes contributed on the Pewee mention its movements on two consecutive days, so that it evidently was migrating in great numbers at that time. Previously several dates were recorded, the earliest of which was its arrival at Fayette, Mo., March 4. It reached Shawneetown, Ill., March 5; Saint Louis, Mo., March 10 (and on the same date was seen the second time at Fayette); Richmond, Kans., March 11; Manhattan, Kans., and Glasgow, Mo., March 14.

During the next nine days no movement was recorded, which may be explained by the fact that from Saint Louis northward a second winter set in with the temperature below freezing almost every night.

From March 23 to March 29 the following scattered notes of "firsts" were made: Odin, Ill., March 29; Aledo, Ill., March 23; Keokuk, Iowa, March 29; Ferry, Iowa, March 28; Knoxville, Iowa, March 23; Des Moines, Iowa, March 24; Newton, Iowa, March 27; Tampico, Ill., March 25; Batavia, Ill., March 28; Rockford, Ill., March 23; Delavan, Wis., March 29; Lanesboro, Minn., March 29. The above records indicate that the van was so demoralized by the cold weather that its movements, when it did start again, were very irregular. The grand move, to which allusion has been made already, took place the last day in March and the first day in April. During these two days the arrival of the Pewee was recorded at Paris, Ill.; Peoria, Ill.; Hennepin, Ill.; Chicago, Ill.; Morning Sun, Iowa; Mount Pleasant, Iowa; Richmond, Iowa; Iowa City, Iowa; Coralville, Iowa; La Porte City, Iowa; Stoughton, Wis.; Milwaukee, Wis.; Leeds Centre, Wis., and Lake Mills, Wis. Following are the only notes contributed for the region north of the stations just enumerated: the species arrived at New Cassel, Wis., April 4; Lake City, Minn., April 4; Durand, Wis., April 5; Hastings, Minn., April 6; Elk River, Minn., April 6, and Oak Point, Manitoba, May 22.

In the fall of 1885 the last Pewee was reported from Elk River, Minn., September 28; from River Falls, Wis., September 27; Lanesboro, Minn., October 7; Grinnell, Iowa, October 17; Iowa City, Iowa, October 3; Mount Carmel, Mo., October 9; and Saint Louis, Mo., October 27. At Gainesville, Texas, the first was seen October 4 and the second November 27. In Concho County, Tex., it is rare in summer and winter, but common in fall (Lloyd).

457. Sayornis saya (Bonap.). [316.] *Say's Phœbe.*

Like the Phœbe of the east, this western bird is an early migrant. In our district it winters in Texas, ranging regularly as far east as the Colorado River (Lloyd). It occurs in eastern Texas, near Houston, in April (Nehrling). Near Fort Brown, on the Lower Rio Grande, in Texas, it is not uncommon in winter (Merrill), and Mr. Sennett took it at Lomita ranch in April. It proceeds north early in the spring. At Boerne, Tex., Mr. Brown saw several and secured two early in February, 1883, during a severe storm. Both were much emaciated. By March 18, 1884, it had reached Ellis, Kans., where it is a constant summer resident. Though not recorded by our observers from any station north of Kansas, yet it does go more than a thousand miles farther northward. On its southward journey it reached winter quarters at San Angelo, Tex., December 19, 1883, at which locality the last spring bird was seen April 22, though a few probably stay to breed in favorable localities. At Ellis, Kans., the bulk came April 18. Toward the east, in Texas, Mr. Ragsdale found it in Clay County in the spring of 1884, but has never seen it at Gainesville, in Cook County. It has been found by Mr. Powell and by others in southeastern Nebraska, and has occurred accidentally in northern Illinois, Wisconsin, and Iowa.

458. Sayornis nigricans (Swains.). [317.] *Black Phœbe.*

During the summer this southwestern species penetrates a short distance into western Texas. The only locality at which Mr. Lloyd has found it is along Spring Creek, in Tom Green County, where it is rare, but breeds. In the spring of 1885 it arrived at San Angelo, Tex., March 14, and was common there March 26. Three eggs were taken April 3 from a last year's nest which had been used a second time.

459. Contopus borealis (Swains.). [318.] *Olive-sided Flycatcher.*

Breeds from northern Minnesota northward and winters below our southern border. Col. Goss says it breeds in Kansas. Though occurring throughout the whole of the Mississippi Valley, this species seems to have almost escaped the notice of the observers. It was seen as a rare transient at Ellis, Kans., and the first was noticed at Lanesboro, Minn., June 2, 1884. In the spring of 1885 the first Olive sided Flycatcher was seen at Saint Louis, Mo., April 30; at Grinnell, Iowa, May 21; and at Lanesboro, Minn., May 18. The last was recorded from Saint Louis May 15; from Gainesville, Tex., May 21; and from Grinnell, Iowa, May 30. In the fall of 1885 the first migrant appeared at Saint Louis, Mo., September 14, and the last was seen there September 25. Mr. Lloyd states that in Concho and Tom Green Counties, Tex., it is a fall migrant, tolerably common in September.

461. Contopus virens (Linn.). [320.] *Wood Pewee.*

A common summer resident in Manitoba and the Mississippi Valley east of the Plains. This species was said by Audubon to winter in Louisiana, but has not been found there by late observers; neither were any notes contributed of its presence in the United States as early as the date of arrival given by Dr. Coues, who says that it enters our district in March. Still, as it reached Saint Louis April 29, 1884, and its average rate of travel is about fifteen miles a day, calculation shows that it ought to have reached the Gulf coast of Louisiana March 18. In the spring of 1884 our earliest date came from near the extreme western limit of its range, namely, Mason, Tex., where it was seen April 16. Farther north in Texas, it was observed at Gainesville, April 29, which is the same day at which it was seen at Saint Louis, three hundred and fifty-four miles farther north and still farther east. The average rate from Mason to Gainesville was about the same as that from Saint Louis to Waukon, Iowa, so that it is probable that the dates express very nearly the actual state of affairs, making it evident that migration along the western part of its habitat is much behind that in the eastern and middle portions. West of Mason the only record came from San Angelo, Tex., where the species was found to be an occasional visitant. Mr. Ridgway states that specimens sent to the Smithsonian Institution were not the western form (*C. richardsonii*), but the true eastern *C. virens*.* Central Iowa was reached in migration May 10, northern

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*Since the above was written, Mr. Lloyd has taken two specimens of *Contopus richardsoni* in Concho County, Tex.

Iowa May 20, and southern Minnesota (at Lanesboro) June 2. The bulk was four or five days behind the van. The Wood Pewee is common in eastern Kansas and rare in western (Goss).

In the fall of 1884 the bulk of Wood Pewees was reported as leaving Williamstown, Iowa, August 24; Des Moines, Iowa, August 29; and Mount Carmel, Mo., September 10. The last was reported from Des Moines, August 29; from Mount Carmel, September 21; and from San Angelo, Tex., September 21.

In the spring of 1885 the first was recorded from San Angelo, Tex., March 14. Several weeks elapsed before the next record was made. At Gainesville, Tex., it was seen April 18; at Saint Louis, Mo., April 28; at Chicago, Ill, May 5; Des Moines, Iowa, May 15; Lanesboro, Minn., May 19; Heron Lake, Minn., May 20; Elk River, Minn., May 22, and Manhattan, Kans., May 16.

In the fall of 1885 the bulk was present at Saint Louis, Mo., September 25, although they were conspicuous September 22. The last was reported from Grinnell, Iowa, September 16; Fernwood, Ill., October 3; Saint Louis, October 5, and Bonham, Tex., November 10.

462. Contopus richardsonii (Swains.). [321.] *Western Wood Pewee.*

A western species. Common in western Manitoba (Seton); frequently seen in western Nebraska (Aughey); a rare summer resident in western Kansas (Goss). In Concho County, Tex., two were shot in the fall of 1886 (Lloyd).

463. Empidonax flaviventris Baird. [322.] *Yellow-bellied Flycatcher.*

Breeds in Manitoba, and doubtless in northern Minnesota also, and migrates through the entire length of the Mississippi Valley, wintering in Central America. The Yellow-bellied Flycatcher was not noticed by any of the observers near the Mississippi south of Saint Louis, though it must traverse that part of the United States in coming from its winter home. In the spring of 1884, at Saint Louis, it arrived May 8, and the next day it was seen at Des Moines, Iowa. May 23 it was seen at Chicago, and May 24 at Lanesboro, Minn. In the southwest the first female was shot at Gainesville, Tex., May 16.

In the spring of 1885 the first arrived at Saint Louis, Mo., May 13; Grinnell, Iowa, May 21, and Lanesboro, Minn., May 20. The last was seen at Saint Louis May 15 and at Grinnell May 23.

465. Empidonax acadicus (Gmel.). [324.] *Acadian Flycatcher.*

A common breeder in all but the northern and western parts of the Mississippi Valley. In eastern Texas (near Houston) it is the only *Empidonax* that remains to breed (Nehrling). The same is true of Southern Louisiana and Alabama (A. K. Fisher). As in the case of many other species, the earliest record of the Acadian Flycatcher in the spring of 1884 came from Saint Louis, where it arrived April 29. The other records are: latitude 39° 12′ in Kansas, May 10; latitude 41° 51′ in Illinois, May 21, and latitude 43° 43′ in Minnesota, May 28. The species is decidedly eastern, and not often found west of the Mississippi. Manhattan, Kans., is near the western limit of its range, and it is quite rare in all parts of Kansas, though it has been traced as far west as Ellis.

In the spring of 1885 the earliest record of the Acadian Flycatcher came from the extreme western limit of its range. It was seen at Gainesville, Tex., April 20. The other records are: Saint Louis, Mo., April 28; Tampico, Ill., May 5; Chicago, Ill., May 9, and Manhattan, Kans., May 20. It was common at Grinnell, Iowa, May 22. It breeds throughout its range. In the fall of 1885 it was last seen at Saint Louis September 14.

466. Empidonax pusillus (Swains.). [325.] *Little Flycatcher.*

Specimens taken by Mr. Lloyd and identified by Mr. Ridgway prove that this western species is a tolerably common breeder at San Angelo, Tex.

466a. Empidonax pusillus traillii (Aud.). [325a.] *Traill's Flycatcher.*

A common migrant in the Mississippi Valley; breeds from Missouri and southern Illinois northward. The earliest date of its migration in the spring of 1884 came from San Angelo, Tex., where it was seen April 27; but in corresponding latitudes near the Mississippi it must have appeared much earlier, since it was seen at Saint Louis, 500 miles farther north, April 29. The rest of the very few notes contributed on this species refer to its arrival at latitude 41° 51′ in Illinois, May 21; latitude 39° 12′ in Kansas, May 22, and latitude 43° 43′ in Minnesota, May 26.

In the fall of 1884 the last Traill's Flycatcher was seen at Mount Carmel, Mo., September 16, and San Angelo, Tex., September 1.

In the spring of 1885 the first was seen at Saint Louis, Mo., May 4, while at Gainesville, Tex., much farther south and west, none were reported until May 16. The first reached Mount Carmel, Mo., May 8; Des Moines, Iowa, May 15; Lanesboro, Minn., May 15; Delavan, Wis., and River Falls, Wis., May 16.

In the fall of 1885 the first Traill's Flycatcher noticed at Emporia, Kans., was seen August 27. The species was still numerous at Saint Louis, Mo., September 16, and was last seen September 25.

467. Empidonax minimus Baird. [326.] *Least Flycatcher.*

In the spring of 1884 the Least Flycatcher, like the Wood Pewee, already mentioned, was reported to have arrived on the same day (April 29) at Gainesville, Tex., and Saint Louis, Mo. Records were received from as far north as Oak Point, Manitoba, but they were too irregular for use.

In the fall of 1884 the last was seen at San Angelo, Tex., September 1.

In the spring of 1885 the reports of first arrivals were as follows: San Antonio, Tex., April 14; Gainesville, Tex., April 20; Saint Louis, Mo., April 30; Des Moines, Iowa, May 5; Hennepin, Ill., May 10; Lanesboro, Minn., May 5; Heron Lake, Minn., May 12; White Earth, Minn., May 16 (about forty seen during the day); Oak Point, Manitoba, May 22. In the fall of 1885 the first was seen at Saint Louis September 14 and the last October 14. The last was seen at Bonham, Tex., September 8.

The facts at present known seem to indicate something phenomenal in the breeding range of *Empidonax minimus.* It is an abundant summer resident throughout Manitoba and the northern States. Specimens (both adult and young) taken by Mr. Lloyd at San Angelo, Tex., during the breeding season have been examined by Mr. Ridgway and pronounced typical *E. minimus;* and Mr. Peters recorded it as breeding commonly in Bonham, Tex. Prof. Aughey states that it sometimes breeds in Nebraska. On the other hand, both Col. Goss and Prof. Lantz give it as a migrant only in Kansas ; and Mr. Widmann positively states that it does not breed in Saint Louis, Mo., where, in 1885, it was last seen May 13.

468. Empidonax hammondi (Xantus). [327.] *Hammond's Flycatcher.*

The only truly Mississippi Valley record of this western species came from Dr. Agersborg, who reported it to be a rare summer resident at Vermillion, Dak. In Texas Mr. Lloyd has found it a tolerably common fall migrant in Tom Green County and rare in Concho County.

469. Empidonax obscurus (Swains.). [328.] *Wright's Flycatcher.*

This also is a western species, or rather southwestern, coming northward in the Rocky Mountains during the summer as far as latitude 49°. Mr. Lloyd has taken it twice in fall migration in Tom Green County, Tex.

470. Empidonax fulvifrons (Giraud). [329.] *Fulvous Flycatcher.*

This species is an inhabitant of eastern Mexico, coming north to Texas (Giraud). The type is in the U. S. National Museum.

471. Pyrocephalus rubineus mexicanus (Scl.). [330.] *Vermilion Flycatcher.*

A tropical species coming north to Texas. In the valley of the Lower Rio Grande it is a tolerably common resident, but more numerous in summer than in winter (Merrill).

472. Ornithion imberbe (Scl.). [331.] *Beardless Flycatcher.*

An inhabitant of Central America and eastern Mexico, coming north to the valley of the Lower Rio Grande, in Texas, where it was taken by Mr. Sennett.

474. Otocoris alpestris (Linn.). [300.] *Horned Lark; Shore Lark.*

This species breeds in northeastern North America and Greenland, wintering in the United States. During its southward journey it extends westward to the Mississippi Valley, where it is abundant in some parts of Illinois and rare in Kansas, but the limits of its winter distribution are not known. It visits Manitoba in October.

474 a. Otocoris alpestris leucolæma (Coues). [300 a.] *Pallid Horned Lark; White-throated Horned Lark.*

Breeds in the interior of British North America and Alaska, coming south in winter to Dakota, Nebraska, Kansas, and westward. (Known locally as Wheatear and Wheat Bird, and confounded by many with the Wheatear of Europe.)

474 b. Otocoris alpestris praticola Hensh. [—.] *Prairie Horned Lark.*

This subspecies and the following occur in the Mississippi Valley, where the present is the prevailing form east of the Plains, breeding abundantly in the northern half and south, at least as far as Kansas and Illinois, and wintering from latitude 43° southward even to Texas. It is abundant in eastern Kansas (Goss) and breeds in Manitoba.

474 c. Otocoris alpestris arenicola Hensh. [—.] *Desert Horned Lark.*

Inhabits the Rocky Mountain region and the Great Basin, coming east to Dakota, where it breeds at least as far east as Devil's Lake. It is a common resident in middle and western Kansas (Goss). In winter it is abundant in Concho and Tom Green Counties, Tex., arriving late in October and departing early in March (Lloyd).

474 d. Otocoris alpestris giraudi Hensh. [—.] *Texan Horned Lark.*

Inhabits eastern and southeastern Texas.

NOTE.—Owing to the want of exact knowledge concerning the breeding and winter ranges of the various subspecies of Horned Larks it is impossible at present to give their distribution more fully than has been done above.

Either the typical *O. alpestris* or variety *praticola* (probably the former) usually reaches northern Minnesota before the second week in February, though the mercury sometimes falls to forty degrees below zero afterwards. The northern limit of the winter range of the species, taken collectively, varies from latitude 42° to 44°, but a few individuals usually can be found along latitude 43° even in the coldest winters. In the winter of 1883-'84 they were unusually scarce in the north, and on March 1 but few had been seen north of latitude 43°. During the next two weeks they advanced to latitude 45°, and March 23 they were noticed at Two Rivers, Manitoba, latitude 49° 28′.

In the fall of 1884 the first migrant appeared at San Angelo, Tex., September 23, where it had become common by November 3.

In the spring of 1885 Horned Larks appeared at New Cassel, Wis., January 28; at River Falls, Wis., February 2; Lake City, Minn., and Elk River, Minn., February 26. Three individuals were seen at Moorhead, Minn., after a short spell of south wind, February 12. They were there continuously after that date. The first came to Larimore, Dak., March 18, and Oak Point, Manitoba, March 28.

In the fall of 1885 the first returning Lark came to Bonham, Tex., November 4, and they were common there by November 10. They appeared at Gainesville, Tex., November 2.

475. Pica pica hudsonica (Sab.). [286.] *Black-billed Magpie.*

Occurs in the western part of the Mississippi Valley as a rather rare visitant from the north or northwest. In western Manitoba Mr. Thompson records it as a rare and irregular resident. In western Kansas it is an occasional fall and winter visitant (Goss). Dr. Agersborg states that it used to be very common in winter about Vermillion, Dak., but has recently disappeared. In western Dakota it is still tolerably common. Robert Kennicott, writing in 1854, stated that the Magpie was "not uncommon in winter" in Cook County, Ill. (Trans. Ill. State Agl. Soc. for 1853–1854, 1855, p. 585.)

477. Cyanocitta cristata (Linn.). [289.] *Blue Jay.*

This species is resident throughout all of the Mississippi Valley and common in all parts except the western plains. In western Manitoba it is given as a summer resident (Seton). It is usually said to be non-migratory, because in most localities some individuals are present the whole year round. The bulk, however, performs quite a regular migration south in the fall and north late in the spring. In addition to this imperfect migration it roves somewhat in search of food. The bulk of its migrations in the spring of 1884 took place during the first two weeks of May, and the first one reached Oak Point, Manitoba, May 29. The Blue Jay is local in its distribution, requiring an abundance of acorns or other mast as a prime requisite for a breeding or wintering place. The following note from Heron Lake, Minn., shows how they are seen during migration at places where they do not breed: "May 14, one seen; in a few days they will be quite plenty and then they will disappear until fall." The Nueces Cañon in southwestern Texas is said to be the winter home of countless myriads. In that case they must migrate to the northeast, for all observers agree that in northwestern Texas they are rather a rare bird. Mr. Lloyd says that its western limit in Texas "seems to be near the mouth of the main Concho, where it is tolerably common." (The Auk, Vol. IV, 1887, p. 290.)

In the spring of 1885 flocks in migration passed Saint Louis, Mo., almost every day from April 21 to April 30; and again, May 12, a party of fifteen or twenty went north. The first returned to Shell River, Manitoba, May 15, and Oak Point, Manitoba, May 24. In the fall of 1885 the bulk of the flocks were reported from Saint Louis September 26. October 5 one troop was seen going south at 9 a. m.

480. Aphelocoma woodhousei (Baird). [292.] *Woodhouse's Jay.*

A bird of the west, occurring in our district in southwestern Texas. Mr. William Lloyd states that it is tolerably common in Concho and Tom Green Counties, Tex., where it is "resident wherever there is skin-oak, at the heads of nearly all the creeks." (The Auk, Vol. IV, 1887, p. 290.) Two nests were found.

483. Xanthoura luxuosa (Less.). [296.] *Green Jay.*

The Green Jay is an inhabitant of eastern Mexico, coming north to the Lower Rio Grande Valley, in Texas, where it is a common resident.

484. Perisoreus canadensis (Linn.). [297.] *Canada Jay.*

This is a northern bird, coming down in winter from the pine forests of Manitoba, Minnesota, and Wisconsin, where it is abundant. It has not been known to breed in Wisconsin, but breeds in northern Minnesota, where I found it in summer in the tamarack swamps.

486. Corvus corax sinuatus (Wagl.). [280.] *American Raven.*

A hundred years ago the Raven was found probably all over the Mississippi Valley, excepting perhaps in the Gulf States. Now civilization has driven it from most of the district, but it is still found locally in almost every State except Mississippi and Louisiana. In western Kansas it is resident and not uncommon (Goss). The migratory movement is too slight to be studied, and is dependent upon the food rather than the weather. At the mouth of Devil's River and the bend of the Rio Grande, in Texas, immense numbers pass the winter and disperse again in the spring. In western Texas its nest has been taken by Mr. Lloyd. In Manitoba it is a resident at some places and a winter visitant at others.

487. Corvus cryptoleucus Couch. [281.] *White-necked Raven.*

A southwestern species; common in western Texas. Resident in western Kansas, where it is rare in summer but common in fall and winter (Goss). Rare in Nebraska. Mr. Lloyd states that it is resident as far east as Tom Green and Concho Counties, Tex., where it is abundant at times. He says: "The bulk retire in fall in large flocks down the Pecos and Devil's Rivers, where they winter by thousands. A nest with six eggs was found May 19, 1882, in a low hackberry; another nest, partly finished, was found May 13, 1883; and a third, with three eggs, May 5, 1885, in low mesquites."

488. Corvus americanus Aud. [282.] *Common Crow.*

Common in name and common by nature, the Crow is a common summer bird over all of Manitoba and the Mississippi Valley, and common in winter from northern Iowa southward. In winter it is especially numerous at Pierce City, Mo., where Mr. Nehrling says that thousands spent the night near his house, and is still more abundant at Saint Louis, where its numbers, after the increase of the first half of January, reached near fifty thousand. The most northern record in the winter of 1883–'84 was at Lanesboro, Minn. In the spring of 1884 migration began about the same time as the real migration of the Purple Grackle, that is, in the second week in March. Passing irregularly north, crows reached the stations around latitude 45° in Minnesota March 13 and 14; Frazee City, Minn. (latitude 46° 33′), March 17, and finally arrived at Oak Point, Manitoba, on the last of the month. They were marked as coming to Portage La Prairie, Manitoba, April 4, which date is said to be later than usual.

During the winter of 1884–'85 (on New Year's day) crows were again seen at Lanesboro, Minn., and either winter residents or very early migrants were seen at New Cassel, Wis., January 27. From the records for the spring of 1885 it is easy to trace two routes and times of migration. The first was along the Mississippi River. The enormous numbers which roosted at Saint Louis, Mo., March 2, began to decrease rapidly after March 4. At Excelsior, Minn., they arrived March 1; at Minneapolis, Minn., March 7 and March 9 (two observers); at Elk River, Minn., March 14; Saint Cloud, Minn., March 11, and White Earth, Minn., March 20. The second line of migration was over the prairie along the valleys of the Missouri River and the Red River of the North. The first came to Emmetsburgh, Iowa, March 26; Grand View, Dak., March 30; Rochester, Minn., March 31; Argusville, Dak., March 31; Menoken, Dak., March 31; and probably also on the same day to Moorhead, Minn. (latitude 46° 56′); for although I saw none there until the next day, yet their abundance then (about two hundred being seen) would indicate that some of them had come the day before (March 31). On this same migrating route they reached Two Rivers, Manitoba, April 2, and Shell River, Manitoba, April 3. They were reported from Oak Point, Manitoba, March 28, and Ossowo, Manitoba, March 29; which fact seems to indicate that the crows which appeared at these two places had come by way of the Mississippi River. Continuing the comparison between Oak Point and Shell River, we find that although Shell River is half a degree farther south the average date of arrival was later than at Oak Point. Out of fourteen of the more common birds which were reported by both stations, two arrived at both places the same day, three came to Shell River an average of three days earlier than to Oak Point, and nine came to Oak Point an average of five days earlier than to Shell River.

In the fall of 1885 the Crows began to go to roost in numbers at Saint Louis, Mo., September 24; the bulk arrived October 27, and very many were present November 1.

Mr. Lloyd states that in the eastern part of Concho County, Tex., Crows breed in colonies early in May.

490. **Corvus ossifragus** Wils. [283.] *Fish Crow.*

The home of the Fish Crow is in the South Atlantic and Gulf States, where it is resident, especially along the coast. It is common in southern Louisiana.

491. **Picicorvus columbianus** (Wils.). [284.] *Clarke's Nutcracker.*

Dr. Agersborg furnished the only record from the observers for this Rocky Mountain bird, he having taken it as an accidental visitant at Vermillion, Dak., in October, 1883. Professor Aughey saw it once in Nebraska.

492. **Cyanocephalus cyanocephalus** (Wied). [285.] *Maximilian's Nutcracker; Piñon Jay.*

A rare visitant from the Rocky Mountain region. October 23, 1875, three specimens were killed near Lawrence, Kans. (Snow).

494. Dolichonyx oryzivorus (Linn.). [257.] *Bobolink.*

A common migrant in the Mississippi Valley, breeding from Kansas and Illinois northward. In 1884 fifty-four notes were furnished on this species. Studied with relation to the warm and cold atmospheric waves, in the same way that was done in the case of the Kingbird (see pages 142–147), it is found that just 50 per cent. of the records are bad—that is, they agree with the cold wave instead of the warm; 11 per cent. are indeterminate, and only 39 per cent. agree with the maximum of the warm wave. Why it should be thus is not known, though the fact that the bird frequents marshy meadows, and hence is less easily noted, may partially account for the difference.

Wintering south of the United States, the earliest record of its appearance was from Saint Louis, where it arrived April 29. The notes from Illinois are of no value. Bobolinks were noted at latitude 43° 06′ in Wisconsin, May 1; the bulk reached latitude 43° 20′ in Wisconsin with the next wave, May 5; while with the following wave, May 11, the first reached latitude 44° 26′, the bulk following on the 18th. West of the Mississippi the movements agree a little better with atmospheric waves. After reaching Saint Louis, April 29, the next wave brought them at latitude 40° 50′ in Iowa, May 3, and latitude 42° 01′ and latitude 42° 18′ in Iowa, May 5, while arrivals at latitude 43° 48′ and 45° 25′ in Minnesota were noted the day after the maximum wave, on May 10. The movements of the bulk averaged about ten days in the rear of those of the van.

On the prairie the maximum wave of the night of May 9 brought them to latitude 40° 53′ in Nebraska and latitude 41° 21′ in Dakota. They reached latitude 46° 58′ in Dakota May 17, and May 23 were noted from latitude 50° 30′ in Manitoba.

In the fall of 1884 the first Bobolink at San Angelo, Tex., was seen October 2, and at Abbeville, La., one was reported August 4.

In the spring of 1885 the earliest record came from Mount Carmel, Mo., April 20, but it was not again seen there until May 1. In the meantime it had been seen at Saint Louis, Mo., April 28. A few stations in northern Illinois reported Bobolinks May 5 and 6, but the pronounced movement did not take place until May 10 to 12, during which three days the species spread from southern Iowa to latitude 45° in Wisconsin and Minnesota, and to Huron, Dak., latitude 44° 21′. They reached Argusville, Dak., May 14; Menoken, Dak., May 15, and Shell River, Manitoba, May 18. In the fall of 1885 the last Bobolink was reported from Elk River, Minn., September 3; Fernwood, Ill., September 20 and Grinnell, Iowa, July 27.

494 a. Dolichonyx oryzivorus albinucha Ridgw. [——] *Western Bobolink.*

The western race of the Bobolink is found from Dakota to Utah and Nevada, and north into western Manitoba, where it was reported as an abundant summer resident.

495. Molothrus ater (Bodd.). [258.] *Cowbird.*

A common breeder throughout the Mississippi Valley and Manitoba. In winter flocks abound in the Southern States, extending north to southern Illinois in the east, and in the west to the central part of Indian Territory. At San Angelo, Tex., it was reported as resident, a few remaining in winter, but most of them going south. On asking Mr. Lloyd whether he was sure it was *M. ater* that nested there, he replied that its identification as the typical bird was positive, and that he had found their eggs from May 1 to June 10 in nests of the Orchard Oriole, Nonpareil, Bell's Vireo, etc.* In this he agrees with Mr. Nehrling, who makes the same statement concerning its breeding at Houston, Tex. In Indian Territory, at Caddo, they were quite common throughout the winter of 1883–'84, but all the birds were either females or males in the garb of the female; no bright males were seen until January 17, and no flocks of males until January 19. The bulk of males came January 22; the bulk of the species left February 22, and the last disappeared March 24. At Saint Louis, in the spring of 1884, the first came March 17, but only a few were seen. At Carlinville, Ill., some were seen March 31, and at Burlington, Iowa, April 7. So far the dates probably represent somewhat nearly the actual movements of the species. Then came the severe and widespread snow-storms of the early part of April, as a result of which only one record north of Burlington was made previous to April 16, but when the records began again they were so thoroughly and hopelessly contradictory that it is useless to attempt to reconcile them. All that can be said is that "firsts" came to stations between the parallels of 41° and 45° all the way from April 16 to May 15, being quoted from latitude 45°, April 16, and from latitude 41°, May 15, with all intermediate dates between. The first was recorded from Argusville, Dak., May 9. There seems to be an error in the date (April 14) given from Oak Point, Manitoba. The female of the Red-winged Blackbird was marked as coming the same day, and possibly was mistaken for it.

In the fall of 1884 the last migrant was seen at Mount Carmel, Mo., September 20.

In the spring of 1885 the records from stations east of the Mississippi River were too irregular for use. From those farther west the following may be selected as giving an approximate idea of the time of migration. The first were noted at San Angelo, Tex., March 6; hundreds were seen at Bonham, Tex., March 23; the first was reported from Saint Louis, Mo., March 30; Des Moines, Iowa, April 10; Waukon, Iowa, April 21; Lanesboro, Minn., April 23; Heron Lake, Minn., April 28; Argusville, Dak., May 4; Shell River, Manitoba, May 14. In the fall of 1885 the last Cowbird at Grinnell, Iowa, was seen November 1; at Saint Louis, Mo., the last flock was seen October 30; at Bonham, Tex., the first migrants appeared October 14.

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* In a recent paper on the birds of western Texas Mr. Lloyd gives this species as a spring and fall migrant, and the Dwarf Cowbird as the form which breeds there. (The Auk, Vol. IV, 1887, p. 290.)—C. H. M.

495a. Molothrus ater obscurus (Gmel.). [258 a.] *Dwarf Cowbird.*

This is the common Cowbird from middle Texas southward and wes ward. It was noted at San Antonio by Mr. Atwater, breeding there i company with the typical form. Mr. Lloyd states that it is abundan in summer in Tom Green and Concho Counties, Tex., and Mr. Nehrlin records it as a common breeder in eastern Texas, near Houston.

496. Molothrus æneus (Wagl.). [259.] *Bronzed Cowbird.*

A Mexican and Central American species, whose northern limit is i the valley of the Lower Rio Grande, in Texas. It was found breedin abundantly at Fort Brown, Brownsville, Hidalgo, and Lometa Ranch by Dr. J. C. Merrill and Mr. Geo. B. Sennett. One of our observers Mr. Negley, says it is abundant at Eagle Pass.

497. Xanthocephalus xanthocephalus (Bonap.). [260.] *Yellow-headed Blackbird.*

Breeds from Manitoba southward. Though a bird principally of the Plains and of western North America, it may be found in restricted localities over most of the Mississippi Valley. It seldom winters as far north as Illinois, but is found in the Southern States. In eastern Texas near Houston, it is a common winter resident (Nehrling). In the valley of the Lower Rio Grande it occurs in winter, but is not common (Sennett & Merrill). It is very abundant in winter at Mermenton, La., and was reported as a spring visitor at Corinth, in northeastern Mississippi. Most of the migration takes place in April. In the spring of 1884 the Yellow-headed Blackbird reached Oak Point, Manitoba, May 5, and the bulk appeared the next day at Portage la Prairie, Manitoba. Many records were received, but they are very irregular. For example, in Minnesota the first was seen at latitude 45° 05′, June 3; at latitude 47° 25′, May 17, and at latitude 46° 33′, April 8, when it was "common." It is probable that the irregularity in the notes on this species is due to the restricted localities which the birds visit year after year, their passage to and fro being unnoticed. Should the observer know these spots and watch them closely he will find the real first, but if he trusts to chance to show him the bird his record will be much behind. While living in Wisconsin there was a spot covering a few acres, 19 miles distant, where the birds could be found every year; but in over a dozen years' residence none were ever seen in the marshes within 5 miles of town, though during this time they had slightly extended their range.

In the fall of 1884 flocks of Yellow-headed Blackbirds were seen at San Angelo, Tex., September 28, and two days later the last had gone.

In the spring of 1885 the record of no other species showed so plainly that its migration on the Plains was much later than in corresponding latitudes nearer the Mississippi River. The Texas records were quite regular and are as follows: At Eagle Pass, Tex., the first was seen April 12; San Antonio, Tex., flocks were seen passing north almost every day from April 13 to May 25, on which date a flock of several thousand was seen in a field where oats were being cut. At both Bonham, Tex., and Gainesville, Tex., the first were seen April 22. The Kansas records also were regular, so far as that single State is concerned. They were: Emporia, Kans., April 11; Richmond, Kans., April 15, and Manhattan, Kans., April 18. The eastern records were much earlier. The first came to Paris, Ill., April 2; to Heron Lake, Minn., April 12 (common there April 16); to Huron, Dak., April 14; to Argusville and Menoken, Dak., April 20 and 21; and to Two Rivers and Shell River, Manitoba, May 1.

498. Agelaius phœniceus (Linn.). [261.] *Red-winged Blackbird.*

An abundant summer resident in Manitoba and the Mississippi Valley. It breeds abundantly in eastern Texas and in the valley of the Lower Rio Grande. In 1884 sixty-eight observers reported on the movements of this well known bird. But, as in the case of most other species, the number of records from the southern part of the district were few. Enough, however, were received to confirm the belief that these Blackbirds gather in flocks in winter; that they have regular roosts, sometimes in company with Grackles or even Crows; that the females do not always retire so far to the south as the males, or so early in the winter; and that the males precede the females in spring migration.

At Yazoo City, Miss. (latitude 32° 50′), they were seen "dusting" themselves with snow in January. At Abbeville, La. (latitude 29° 57′), they are common winter residents. At Caddo, Ind. Ter., they were common during the entire winter of 1883-'84. At Saint Louis, Mo., a flock of females was seen December 29 and again during January. At Manhattan, Kans., a few females were seen during January and February, always in warm, cloudy weather. They seem to winter in flocks as far north as Kansas, Missouri, and southern Illinois—say up to latitude 40°. Their accidental occurrence in winter has been noted at various more northern points. At Alda, Nebr. (latitude 40° 53′), three or four were seen every few days during the entire winter coming to the cattle yards to feed. At Lake Mills, Wis. (latitude 43° 06′), an accidental visitor arrived February 19 and was fed with corn by a farmer for several weeks.

The first northward movement recorded in the spring of 1884 came from Pierce City, Mo. (latitude 36° 56′), where large flocks passed north January 29 and 30. At Saint Louis, January 31, a flock of twenty went north in advance of the Robins. On January 22 they began to increase in numbers at Caddo, Ind. Ter. The first wave of migration reached Odin and Carlinville, Ill., February 12, when large flocks arrived. February 16 additional flocks of migrants arrived at Caddo, Ind. Ter.

No further progress was recorded until March 11, when large flocks appeared in the lowlands near Saint Louis. On the following day migrants appeared at Osceola and Polo, Ill. March 15 the first arrived at Ferry, Iowa; Manhattan, Kans. (a flock of young males), and Unadilla, Nebr. From this date to the close of the month was but a succession of records of appearance, either of first or of bulk, at the various stations throughout Missouri, Illinois, Iowa, Wisconsin, and Minnesota.

At Green Bay, Wis., the first arrived April 6. On the same day the first was seen at Pine Bend, Minn. Two days later (April 8) the first was seen at Frazee City, Minn. Farther west the progress seems to have been less rapid and more irregular. March 20 the first arrived at Linwood, Nebr., and Vermillion, Dak. (the last were all males); March 30 at Barton, Dak.; April 3 at Two Rivers, Manitoba. April 12 the bulk arrived at Manhattan, Kans. April 14 the first arrived at Oak Point, Manitoba, the most northern point of observation. Ten days later, April 24, the first was noted at Ellis, Kans., and at Menoken, Dak., two points almost 600 miles apart. The limited extent of marshy country in Kansas will probably account for their late arrival at Ellis.

In the fall of 1884 the bulk of the Red-shouldered Blackbirds left Elk River, Minn., November 1, and Des Moines, Iowa, November 8 (nor were any seen there after this date). At Mount Carmel, Mo., large numbers passed August 15, and the last was noted November 6. Even in southern Louisiana many passed southward as early as August 4.

During the winter of 1884–'85 a few irregular notes were contributed. A Red-shouldered Blackbird was taken in January at Paris, Ill., and a few were seen at odd times during February at Mount Carmel, Mo., and Odin, Ill. In the spring of 1885 the first regular northward movement recorded occurred on the last day of February, when a flock of a hundred passed over Corinth, Miss. The next day they were seen at Pierce City, Mo., and March 2 at Saint Louis. From March 4 to March 8 a few scattered flocks visited various parts of northwestern Illinois near the Mississippi River. They were seen at Aledo, Hennepin, and Tampico. From March 11 to March 14 the same thing took place along the valley of the Des Moines River, where flocks were seen at Knoxville, Des Moines, Newton, and Grinnell, Iowa. The first full wave which passed over this country (that is to latitude 42° in Illinois and Iowa) was reported March 25 and March 26 from Mount Pleasant, Iowa, La Porte City, Iowa, Fernwood, Ill., and Batavia, Ill., with stragglers at Delavan, Wis., and Heron Lake, Minn. The largest wave of the season in the migration of this species occurred during the last day of March and the first day of April. This wave brought "firsts" to Sioux City, Iowa, Emmetsburgh, Iowa, Williamstown, Iowa, Rockford, Ill., Clinton, Wis., Milwaukee, Wis., Lake Mills, Wis., Leeds Centre, Wis., and Ripon, Wis., and to Lanesboro, Minn., with a scout at Luck, Wis. During the next three days the first were noted at Durand, Wis., and Lake City, Minneapolis, Fridley, and Elk River, Minn. None were noted by the observers at Green Bay, Wis., until April 17. They reached White Earth, Minn., April 6. On the Plains the movement was as follows: Emporia, Kans., was reached March 12, and Manhattan, Kans., March 29. At Unadilla, Nebr., an irregular and very large flight occurred March 11, but no more were seen until the regular advance of April 1. They were reported from Linwood, Nebr., March 31; Grand View, Dak , April 10; Huron, Dak., April 12; Two Rivers, Manitoba, April 16; and Oak Point, Manitoba, April 18.

In the fall of 1885 the last was reported from Green Bay, Wis., September 23; Iowa City, Iowa, October 15; Fayette, Mo., October 20; and Mount Carmel, Mo., November 15. Stragglers were seen at Grinnell, Iowa, as late as November 21, and at Lanesboro, Minn., November 4. At Saint Louis, Mo., several large flocks were seen October 5; the height of migration was reached October 11, and many flocks went south November 8 and 12.

The breeding habits of the Red-wings are well known. They remain to nest in favorable localities throughout Missouri and eastern Kansas. Probably not a few breed in Indian Territory. At Saint Louis males and females were together at breeding stands April 30 (1884), and the last flock of females passed northward May 11.

501. Sturnella magna (Linn.). [263.] *Meadowlark.*

The eastern Meadow lark is a common and well known bird from the Mississippi eastward; west of the Mississippi it is found with the western Meadow-lark (*S. neglecta*) as far as the edge of the Plains, beyond which it is almost entirely replaced by that species. In southeastern Dakota Dr. Agersborg says the eastern form does not occur; in Kansas it is common in the vicinity of Lawrence and Topeka; but at Manhattan, 50 miles farther west, it is almost replaced by *S. neglecta.*

The winter quarters of the eastern Meadowlark do not seem to be well defined. Apparently it is abundant in the lower valley of the Mississippi, wherever there are suitable meadows sheltered from the extreme cold; but it seldom winters here so far north as it does in the Atlantic region. In going westward from the shelter of timber-belts it seems to retire farther southward. Thus, in Illinois it is common in sheltered localities as far north as latitude 40°, while farther west, on the Plains, except in favorable seasons, it retires farther southward, being rare north of latitude 38° in Kansas and Missouri. It is common in winter near Fort Brown, in the valley of the Lower Rio Grande (Merrill). In 1884 sixty-two observers in the Mississippi Valley sent notes concerning this bird. At Eagle Pass, Tex., on the Rio Grande, it was reported as plentiful all winter. At San Angelo, Tex., it was reported as resident and abundant in winter. The Nueces Cañon is the winter home of countless myriads. At Mermenton, La., near the Gulf coast, they are resident and much more abundant in winter than in summer. At Caddo, Ind. Ter., they are resident, but not so common as *S. neglecta.* At Darlington, Ind. Ter., some remained throughout the winter of 1883–'84. At Linwood, Nebr., one was seen February 16. It may have remained there all winter or have been an adventurous scout of the army that moved from winter quarters in Texas about this time. At Odin, Ill., they were common February 2, in small flocks. At Danville, Ill., they were reported as resident.

Early in February, 1884, winter quarters were moved from southern Louisiana and Texas northward, but, except in the case of a few individuals, none reached points beyond the usual bounds of their winter home. By February 26 few were left on the southern border.

About March 8 the first general wave of migration set in. The first records, too, unlike those of most birds, came from the prairie region. On March 8 they arrived at Caddo, Ind. Ter.; March 9 at Unadilla, Nebr.; and March 10 at Des Moines, Iowa. These were the advance-guard. The great army followed close in the rear, reaching Darlington, Ind. Ter., March 10, and Linwood, Nebr., about the same time.

At Saint Louis the first silent arrival on the lowlands was noted March 11. The bulk followed March 17 in flocks of twenty to twenty-five, noisy. By this date the advance had spread throughout Illinois and the greater part of Iowa. From March 8 to the close of the month there was but one day on which the first appearance of the Meadowlark was not reported at some station. There seems to have been no general interruption in the northward movement. On March 28 the first arrival was noted at Green Bay, Wis., Lanesboro, Minn., and Red Wing, Minn. On the same day the bulk reached Barton, Dak., and was reported at Fridley, Minn. March 27 the first reached Larimore, Dak., and Elk River, Minn.

As the eastern Meadowlark is known to breed abundantly north of the United States, it is probable that many of those which arrive at the different stations in Minnesota and Dakota are but transient visitors. Little has been noted on this point, or as to the time of nesting at the different stations. At Saint Louis they were noisy and excited April 14. At Manhattan, Kans., nesting began early in May. The only record from Manitoba came from Two Rivers, where the first was noted April 18. From the date at hand it seems that during migration this species lingers longest in the northern part of the United States. It seems to move quite rapidly over the greater part of the way, and to take the last portion leisurely.

In the fall of 1884 the bulk left Elk River, Minn., September 29, and the last was seen there October 15. At Des Moines, Iowa, the bulk left October 20, and the last was seen November 9; at Shawneetown, Ill., they were seen in numbers all winter. The first came to San Angelo, Tex., October 5, and to Mason, Tex., October 11.

The notes on the migration of the eastern Meadowlark in the spring of 1885 indicate that the species does not migrate by rushes, but travels a few miles almost every night from the time of starting until the journey's end is reached. This starting took place March 3 at Saint Louis, Mo., and Paris, Ill. March 10 brought them to Mount Carmel, Mo., Fayetteville, Mo., and Glasgow, Mo., while a couple of scouts had previously visited Grinnell and Newton, Iowa. March 13 and March 14 a regular advance was made to Ferry, Iowa; Richmond, Iowa; Tampico, Ill. (both observers), and Hennepin, Ill. Nearer the Mississippi River they were noted March 15 and March 16 at Mount Pleasant and Morning Sun, Iowa, and Aledo and Peoria, Ill., though it is probable that at all four of these places the birds actually came March 14. March 25 and March 26 they were found moving in the vicinity of Lake Michigan, at Batavia, Ill.; Delavan, Wis., and Stoughton, Wis. March 27 they reached Milwaukee, Wis., and Williamstown, Iowa. The last days of March and the first day of April were days of enormous migration in the Upper Mississippi Valley, bringing Meadow-larks to Waukon, Iowa; Lanesboro, Minn.; Lake City, Minn.; Leeds Centre, Wis.; Ripon, Wis.; and New Cassel, Wis. April 5 they were noted from Durand, Wis.; River Falls, Wis., and Green Bay, Wis.; and April 6 a half dozen were seen at White Earth, Minn. In the fall of 1885 the last left River Falls, Wis., September 26; Grinnell and Iowa City, Iowa, October 11; Des Moines, Iowa, October 18; Fernwood, Ill., October 25; and Mount Carmel, Mo., November 13. The first migrant reached Bonham, Tex., October 14; the next October 16; and the species was common there October 20.

501 a. Sturnella magna mexicana (Scl.). [263 *a.*] *Mexican Meadowlark.*

From Mexico this form reaches only a little way into our district, keeping near the Rio Grande River, where it is common in summer. It was recorded by Mr. Negley as common at Eagle Pass, Tex.

501 b. Sturnella magna neglecta (Aud.). [264 *b.*] *Western Meadowlark.*

Chiefly a bird of the Plains. Breeds from western Manitoba southward. It breeds commonly in western Minnesota (Roberts & Benner, Bull. Nutt. Ornith. Club, Vol. V, 1880, p. 15). It is a common resident in western and middle Kansas (Goss). On the western line of migration, in the Mississippi Valley, the eastern Meadow-lark is replaced by this form, which is well marked both in plumage and song. In the eastern parts of Texas, Indian Territory, Kansas, Nebraska, and Dakota the eastern form predominates, but on the Plains farther west it disappears and is replaced by *S. neglecta*, which is found as far eastward as northeastern Iowa and northern Illinois.

At San Angelo, Tex., it was reported as resident. Probably the greater number pass northward to breed, since at Mason, Tex., the bulk was reported as departing March 31, 1884, though a few remained as late as April 17. At Caddo, Ind. Ter., it was reported as resident, outnumbering the eastern form. In fall migration it was abundant, in flocks of 200 to 500; but only a few were seen in the coldest weather. The first of the transients returned February 16. At Ellis, Kans., the first arrived March 10; and at Manhattan, Kans., a pair remained all winter on the farm of the State Agricultural College. The first migrants came March 1; the bulk came March 13. On March 18 large flocks were seen in full song. Some of the eastern form accompanied them, but they were not numerous. Both *magna* and *neglecta* breed here, but *neglecta* is much more abundant. Nests were seen as early as May 9. Two broods are raised in a season. At Vermillion, Dak., the first was seen March 20; at Argusville, Dak., March 27; at Oak Point, Manitoba, May 17.

Dr. Agersborg states that the western Meadowlark breeds abundantly in southeastern Dakota, to the exclusion of the eastern.

In the spring of 1885 no distinction was made in the records of observers between the eastern and western Meadowlarks, and it was thought that they could not be separated until a decided difference was discovered in the times of their migration. The general rule holds good for fully nine-tenths of the migratory birds of the district, that those which pass over the Plains migrate several days or even weeks later than their fellows which are traveling nearer the Mississippi River. Hence, when we find that the Meadowlarks of the Plains move quite uniformly a week or more *in advance* of their eastern brethren, it may be safely concluded that the difference in time is caused by a difference in the species. These western birds were quite plentiful at Ellsworth, Kans., during the month of February, and on the 4th of March appeared at Unadilla and Linwood, Nebr., being common at Linwood by March 12. They reached Grand View, Dak., March 21; Sioux City, Iowa, March 22; Huron, Dak., and Emmetsburgh, Iowa, March 25; Heron Lake, Minn., March 26; Moorhead, Minn., March 31, where they were heard and seen over a sheet of snow which had fallen the day before. At Menoken, Dak., the first was seen April 4; at Larimore, Dak., April 5; at Ossowo, Manitoba, April 6; and at Oak Point, Manitoba, April 9.

503. **Icterus audubonii** Giraud. [266.] *Audubon's Oriole.*

The home of Audubon's Oriole is from central Mexico north to the Lower Rio Grande Valley, in Texas, where it is a tolerably common resident. It is the only Oriole which spends the winter within the United States.

505. **Icterus cucullatus** Swains. [269.] *Hooded Oriole.*

The Hooded Oriole inhabits eastern Mexico, coming north to the Lower Rio Grande, in Texas, where it is a common summer resident, and the most abundant of the four Orioles that breed there.

506. **Icterus spurius** (Linn.). [270.] *Orchard Oriole.*

The Orchard Oriole is a common summer resident in most parts of the Mississippi Valley, breeding from southern Texas to central Minnesota and Dakota. It is a common breeder at Brown's Valley, on the boundary between Dakota and Minnesota (Roberts & Benner, Bull. Nutt. Ornith. Club, Vol. V, 1880, p. 15); and Mr. J. A. Allen found a few as far west as Heart River, Dak., west of the Missouri (Proc. Bost. Soc. Nat. Hist., Vol. XVII, Oct., 1874). It winters south of the United States, and crosses our border about the last of March. Its migration is steady and uniform. Its advance northward occurs at the same time on both sides of the Mississippi, and even on the Plains. Moreover, it is so conspicuous a bird that it is easily observed. In the spring of 1884 the first male arrived at San Angelo, Tex., April 13, and the first female three days later. At Gainesville, Tex., the first came April 14; at Abbeville, La., April 16. East of the Mississippi they appeared earlier, the first male being seen at Rodney, Miss., March 31, and the first female April 9. April 27 they reached Griggsville and Danville, Ill., and the next day three old males were seen at Saint Louis. April 29 they were seen at Fayette, Mo.; April 30, at Manhattan, Kans., and by May 10 they had advanced to latitude 41° 58′ in Illinois, latitude 41° 40′ in Iowa, and latitude 40° 53′ in Nebraska, though the probability seems to be that the advance was made simultaneously to all places on the 7th. May 12 they came to Laporte City and Waukon, Iowa, with one a little behindhand at Milwaukee, Wis., May 17. At Lanesboro, Minn., they were seen May 23, three days after they had reached Elk River, Minn. Elk River is near the northern limit of their range. They breed commonly in southeastern Dakota. A few have been seen in central Dakota, and they have been recorded from White Earth, Minn. (latitude 47°). North of this there appears to be no record. The bulk moves closely behind the first, two or three days only in the rear. The full record from Saint Louis is as follows:

> The first came April 28, when three old males were in song at their breeding places; April 29 the bulk of old males arrived; April 30 the first two-years-old male; May 5 the first female and an increase of young males; May 6, conspicuous and noisy. The height of the season was attained May 5 and 6. May 8, several old males were mated. May 9, first one-year-old male arrived; bulk of females arrived; some beginning to build. May 17, males and females always together. May 31, incubated eggs were found.

In the fall of 1884 the last old male Orchard Oriole left San Angelo, Tex., August 31; the last young male, September 10; the last female, September 6.

The record of this species was so regular during the spring migration of 1884 that its movements in 1885 were watched with much interest. About a dozen irregular notes were contributed in 1885, but taken as a whole its record still stands as that of a species of unusual uniformity in its migrations. It was first seen, just after its arrival in the United States, at Houma, La., March 28. At San Angelo, Tex., in the same latitude as Houma, but farther west, none were seen until April 7, though they were seen April 10 at Bonham, Tex., and April 11 at Gainesville, Tex., which latter note agrees very well with the record from Houma. The probable explanation of the lateness of the record at San Angelo is found in the altitude of the place, which is nearly two thousand feet. Saint Louis, Mo., was reached April 21; and, although the bulk of males was noted there the next day, there was no record from any neighboring station until April 27, when they were reported from Odin, Ill. April 28 they were seen at Paris, Ill., and Fayette, Mo.; and April 30, at Emporia and Manhattan, Kans. The next advance was recorded May 5, when they reached Morning Sun, Iowa, Des Moines, Iowa, Peoria, Ill., and Hennepin, Ill. May 7 one was seen at Sioux City, Iowa. May 15 and May 16 a large wave extended from latitude 42° to latitude 45°, and carried them to their journey's end. The most northern stations from which records were received are: New Richmond, Wis., Elk River, Minn., and Huron, Dak., though at this last place they were not noted until May 20. The full record from Saint Louis, Mo., was: "April 21, first; April 22, first female and bulk of males; April 28, first male of third year; May 5, first male of second year; May 13, full numbers. The bulk of females arrived the first week in May."

In the fall of 1885 the last migrant left Grinnell, Iowa, September 10. The summer residents left Mount Carmel, Mo., June 7. The last migrant left Bonham, Tex., September 15.

507. Icterus galbula (Linn.). [271.] *Baltimore Oriole.*

The Baltimore Oriole is a common summer resident throughout most parts of the Mississippi Valley proper, breeding from the Gulf States to Manitoba. In the spring of 1884 the first record of its migration was made April 7, when it appeared at Rodney, Miss., and the last May 25, when it reached Oak Point, Manitoba. These dates indicate an average speed of 27 miles a day. In 1883 it was found that the rate of its migration was very uniform. Hence it will be interesting to trace the record for 1884 and see how the two agree. Saint Louis, Mo , was reached April 26, which indicates a rate of 25 miles a day; but in going directly north we find a record on the 25th at Hillsborough, Ill., which would make a speed of just 27 miles a day. About April 29 and April 30 there seems to have been much movement—not so much the advance of the van as the filling up the country already traversed, bringing the bulk to the region from latitude 39° 30′ southward, and the van to latitude 41°, and in the west to Manhattan, Kans. (latitude 39° 12′). Continuing the journey at the rate of 27 miles a day, the species should have advanced by May 6 to about latitude 43° 30′; and the records received demonstrate the correctness of this computation. May 5 and May 6 were days of special movement in Iowa, Minnesota, Illinois, and Wisconsin. During these days there were records over all of northern Illinois and southern Wisconsin to latitude 43° 06′, with a stray one at latitude 44° 22′; and Minnesota shows good records at latitude 43° 43′, with an extra advance along the Mississippi River to latitude 44° 32′. May 12 should have found it at latitude 46°, and records were received of its appearance that day at 45° 25′ and 46° 33′ in Minnesota. Hence it appears, omitting a few minor local variations which were to be expected, that the species shows a remarkable uniformity in its rate of migration throughout this long distance. There was, however, no trace of the increase of speed from the south northward which was noticed in 1883, the highest rate being in the middle districts during the first week in May In the prairie region the records were somewhat later, the birds reaching latitude 39° 12′ in Kansas, April 30; 40° 53′ in Nebraska, May 9, and 44° 21′ in Dakota, May 22. Farther west, almost at the extreme limit of its western dispersion, it was observed at Gainesville, Tex., and Ellis, Kans. The full record from Saint Louis is as follows:

April 26, first (three males at stands calling); April 28, bulk of males arrived (in all the notes the bulk of the species averaged about four days behind the first); May 3, first females (the average for females was seven days behind the first, and as the arrivals of the bulk may be separated into two series, one about two or three days in the rear of the firsts, and the other of seven or eight, it is evident that the first series indicates the arrival of the bulk of the males, while the second indicates the increase of the species as a whole, caused by the arrival of the females); May 5, bulk of females and many transients arrived, making this day the height of the season. (As has already been stated, this day and the next were the days of special movement of this species, and this seems to have been true over an immense area of country, stretching from latitude 34° to latitude 44°.) May 10, the first one-year-old male arrived; May 11, species very much excited, and transient birds of last year present; May 31, set found of six incubated eggs.

In the fall of 1884 the bulk and the last individual left Williamstown, Iowa, August 8. The bulk left Des Moines, Iowa, August 26; the last was seen there August 30. At Mount Carmel, Mo., none were seen after the middle of the month, and at Gainesville, Tex., they were seen August 20.

In the spring of 1885 the migration of the Baltimore Oriole in the Mississippi Valley, so far as our stations are concerned, began April 15, when the species was seen at Corinth, Miss. April 20 it reached Shawneetown, Ill., and Saint Louis, Mo. Two days later it appeared at Paris, Ill., one degree farther north. April 25 and April 26 it was reported from Aledo, Ill., and Mount Pleasant and Keokuk, Iowa. April 29 and April 30 the movement extended northeastward up the Rock River Valley to Batavia, Ill., Hennepin, Ill., and Clinton, Wis. On the Iowa River they appeared at Iowa City and Coralville, Iowa, May 1. At Des Moines, Iowa, they were not seen until May 3. May 5 a large wave brought them to Williamstown, Iowa, and carried them up the Mississippi River to Lake City, Minn., and to Ripon and Leeds Centre, Wis. No further advance was made until after the cold snap; then on the 13th and 14th of May they appeared at Green Bay and River Falls, Wis., and Elk River, Minn. Either they traveled earlier on the Plains (where they were noted from Manhattan, Kans., April 21, and Linwood, Nebr., April 24), or else they moved very fast in the latter part of their course, for they were reported from Ossowo, Manitoba, May 15; Shell River, Manitoba, May 16, and Oak Point, Manitoba, May 19. In the fall of 1885 the last migrants were reported from Heron Lake, Minn., September 9; Grinnell, Iowa, September 16; Fayette, Mo., September 1; and from Bonham, Tex., September 5.

508. Icterus bullocki (Swains.). [272.] *Bullock's Oriole.*

This is a bird of the far west, coming east to the western edge of our district. In Dakota it seems to be tolerably common from the

Missouri westward. Dr. Agersborg recorded it as a common summer resident at Vermillion, in southeastern Dakota. It is common in western Kansas, passing eastward even to Manhattan, where, in 1883, the first was seen May 5. In middle Texas it ranges east a little beyond the center of the State. Mr. Lloyd states that it is a tolerably common summer resident in Concho and Tom Green Counties, Tex., "especially on the main streams." He says: "The ordinary date of arrival is April 15 to 20, the birds becoming common about April 24. The females are very retiring. The males are seen with the family as late as September 30. Breeds on the top branches of the mesquite." In southern Texas it ranges farther east. It is an abundant summer resident at Laredo (Butcher). In the valley of the Lower Rio Grande it is a common summer resident (Merrill). In the spring of 1884 it was seen at Mason, Tex., April 7, and San Angelo April 29, when the first male was noted; the first female came May 1, and by May 3 the species was common. This Oriole has been found at Gainesville, Tex., where, in 1876, the first appeared April 29. It winters in Mexico and breeds throughout all its United States range north to British America. At San Angelo it was found breeding from May 15 to June 1, with six eggs in a clutch.

In the fall of 1884 the last Bullock's Oriole was seen at San Angelo, Tex., August 31. The preceding year it had been noted much later, the last female being seen September 14 and the last male October 14.

In the spring of 1885 the first was seen at San Antonio, Tex., April 11, and at Mason, Tex., April 9. They were common at Mason April 16.

509. Scolecophagus carolinus (Müll.). [273.] *Rusty Blackbird.*

A common migrant through the Mississippi Valley as far west as the Plains, where it is principally replaced by Brewer's Blackbird; breeds from Manitoba northward; dispersed in winter over the Southern States from southern Illinois and Kansas southward. In the winter of 1882-'83 its range extended north to Saint Louis. Dr. Coues, in his "Birds of the Northwest," gives some interesting facts concerning the migrations of these two species. He says: "During the breeding season their *habitats* are entirely separate, but they overlap during the fall migration, if not also in winter. In the east, the Rusty Grackle breeds from northern New England (and perhaps farther south in mountains) northward, throughout a great part of the British possessions, from Labrador entirely across to Alaska. Now to take an intermediate point, say Fort Pembina, on the Red River, the extreme northeast corner of Dakota. Here, in the spring and summer, the Rusty Grackle is not known, while Brewer's Blackbird occurs in great abundance, breeding. In the fall, however, the Rusty Grackle enters Dakota from the north on its migration and mixes with the other species" (pp. 198-199). Now if, as Dr. Coues states, the Rusty Crackle does not occur in northeastern Dakota in spring, it would be interesting to know by what course the representatives of this species—which according to Prof.

Aughey, traverse Nebraska in large numbers every spring—get around Dakota on their way to Manitoba and Alaska. Colonel Goss records it as a winter bird in eastern Kansas.

The only good record received of the occurrence together of both species in spring is that given by Mr. Nehrling, who noted a few Rusty Grackles in March, 1881, in company with the flocks of Brewer's near Houston, Tex.; but that was before the Brewer's Blackbirds had commenced their migration.

In the spring of 1884 the Rusty Grackle commenced its northward journey about the last of February, appearing at Manhattan, Kans., where it usually winters, February 13, and at Saint Louis February 26. No further advance was made until after the "second winter;" then they moved again, reaching Des Moines, Iowa, March 22; Chicago, March 29; Lanesboro, Minn., March 30; and West Depere, Wis., April 16. Along latitude 39° in Central Missouri and Illinois the time of greatest abundance was March 21. At Saint Louis the bulk left March 25, and the last was seen April 5.

In the fall of 1884 the first Rusty Blackbird was seen at Des Moines, Iowa, October 23; the bulk arrived October 28; and the last left November 8.

In the spring of 1885 regular migration did not commence until March. The species appeared at Reeds, Mo., March 2; Paris, Ill., March 3 (and again March 5); Saint Louis, Mo., March 14, and the same day at Des Moines, Iowa. April 6 they were noted from Lanesboro, Minn.; April 22, from Argusville, Dak.; and April 24, from River Falls, Wis. The last was seen at Saint Louis, Mo., April 14, and at Lanesboro, Minn., April 22.

In the fall of 1885 they were present in large flocks at Iowa City, Iowa, October 24; and the last one was seen at River Falls, Wis., October 23. At Saint Louis, Mo., the first was seen October 9, and large flocks were going south October 27. A single bird was taken at Gainesville, Tex., in January, 1886.

510. Scolecophagus cyanocephalus (Wagl.). [274.] *Brewer's Blackbird.*

As mentioned in speaking of the preceding species, Brewer's Blackbird is a western bird, coming east to eastern Kansas and Minnesota and occasionally to Illinois. Its true home is from the eastern edge of the Plains westward. It winters from western Kansas southward, and breeds over most of its range. In western Manitoba it is an abundant summer resident, and a few breed at Vermillion, Dak. At Caddo, Ind. Ter., it was the most abundant Blackbird in the winter of 1883-'84. During the spring and fall there were clouds of them, and many flocks stayed all winter. That they breed there is shown from the fact that a bird was found which was too young to fly. By March 5 their winter numbers had scarcely increased, from which fact it is pretty safe to conclude that few winter directly south of Caddo, the bulk passing to the southwest. March 15 they were most numerous, the bulk having come slowly for a week. They are not so abundant in the spring as in the fall. The bulk depart about March 21. The first arrived at Ellis, Kans., April 5.

In the spring of 1885 the first Brewer's Blackbird was seen at Pierce City, Mo., March 1; at Richmond, Kans., March 4; Laporte City, Iowa, March 26; and at White Earth, Minn., April 6.

Mr. Lloyd states that they are a fall migrant in western Texas, occasionally wintering in Tom Green County, and that they are abundant in winter in the Nueces Cañon. Mr. Nehrling states that they are an abundant winter resident in eastern Texas, and that a few stop to breed in Harris County.

They are an abundant winter resident in the Lower Rio Grande Valley, arriving the first week in October and remaining till April (Merrill).

511. Quiscalus quiscula (Linn.). [278.] *Purple Grackle.*

This, the typical form of the Purple Grackle, is a bird of the Atlantic coast region, from southern New England to Florida. It has been recently recorded as breeding in West Baton Rouge Parish, La., by Dr. F. W. Langdon, who found it common there from the middle of March to the middle of April, 1881. He says of it:

> A common species during our stay; apparently breeding April 1 to 15. A few specimens, evidently residents, shot for purposes of identification, proved to be of the *purpureus* form, thus considerably extending the known area of its distribution. (Journ. of the Cincinnati Soc. of Nat. Hist., Vol. IV, 1881, p. 150.)

511 a. Quiscalus quiscula aglæus. (Baird). [278 *a.*] *Florida Grackle.*

As its name implies, the true home of this Grackle is in Florida. Thence its range extends westward along the Gulf coast to Louisiana, where it was found by Dr. A. K. Fisher in the spring of 1886.

511 b. Quiscalus quiscula æneus (Ridgw.). [278 *b.*] *Bronzed Grackle.*

This Grackle inhabits all of the Mississippi Valley from the Gulf far into British America, and thence eastward to the Alleghanies, breeding throughout its range. It is less common on the Plains. All notes on *Quiscalus* will be treated under this head, whether they have been sent as pertaining to the Purple or Bronzed Grackle, Crow Blackbird, or Boat-tailed Grackle, as it is practically certain that this is the form that has really been seen. There is an interesting and as yet unexplained peculiarity in its *winter habitat.* Near the Mississippi River it is resident as far south as southern Illinois, and it is not uncommon in winter as far north as Minnesota. A fine male was seen at Hastings, Minn., December 29, 1883, where it had successfully withstood a temperature of 30 degrees below zero; and during the whole winter of 1881–'82 small flocks stayed at various points in the State. In Louisiana* it was

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*Since the taking of typical *Quiscalus quiscula* in Louisiana by Dr. Langdon, and the discovery of *Quiscalus quiscula aglæus* near New Orleans by Dr. Fisher, considerable doubt attaches to the Louisiana records of the present subspecies. A profitable field is open to the ambitious student of ornithology who will undertake to ascertain the exact distribution of these three forms in the Gulf States.—C. H. M.

reported to be more abundant in winter than in summer, but there seems to be a gap during the winter between this State and Mexico. It appears to shun the whole State of Texas, passing on to Mexico. Mr. Nehrling did not find it in southeastern Texas, and distinctly says that it "arrives in the spring from its more southern winter home." Mr. N. C. Brown did not find it at Boerne, Tex.; Mr. Lloyd says that only a few stragglers are seen at San Angelo in winter; Mr. Henry records it as a rare winter bird at Mason, and even so far south as Eagle Pass Mr. Negley gives it as arriving in the spring from the south. The case is not without parallel, for much the same thing occurs with the Phœbe (*Sayornis phœbe*) and the Turkey Buzzard (*Cathartes aura*). At Caddo, Ind. Ter., two hundred miles south of its ordinary wintering place on the Mississippi, none were seen after November 12.

In the spring of 1884 the first warm wave brought the Crow Blackbirds back to Saint Louis February 2, and to one or two other places; but winter returned and no real movement took place until after the warm weather came again. At Saint Louis the general thaw began March 10, and March 11 the real migration began. March 12 several flocks arrived at Alton, Ill.; thousands passed over Hillsborough, Ill.; many were seen at Carlinville, Ill., and the first arrived next day at Mount Carmel, Mo., and at Gainesville, Tex. By March 18 the species had advanced to a little beyond latitude 42° in southern Wisconsin and in Iowa, with no irregular notes beyond these points, while in the west they had not been seen north of latitude 35°. During the next week (to March 25) great progress was made, and the van was brought fairly up to latitude 44° 45′ in Wisconsin and Minnesota, but in the west it reached latitude 41° only. In Indian Territory, Kansas, and Nebraska most of the movement took place March 20 and March 21; but in Minnesota and Wisconsin the Purple Grackles helped to swell the ranks of the multitudes of birds that were migrating on March 23 and March 24. This species was reported at Minneapolis and Elk River, Minn., March 28 and March 29, and the bulk about April 1. Thus in the Mississippi River region it had extended well up toward our northern border before the storms of early April set in, and since it reached Oak Point, Manitoba, April 10, it may be supposed that some representatives of the species were north of the storm center, which was in central Dakota, and hence were not delayed in their northward journey. In the west the case was different. A single individual had reached Vermillion, Dak., April 1, but it was far ahead of its fellows, which had been caught and stopped by the snow-storms which continued from about March 20 to April 10. Then they moved again, and from April 16 to April 18 were seen as far north as Argusville, Dak. At Larimore, Dak., out on the prairie, they were not seen until May 4, and far west, at Ellis, Kans., they did not come until April 19.

From the early date of the appearance of this species at Oak Point. Manitoba, and from several other early dates—early as compared with

Dakota dates, but not particularly early when compared with the dates from the region close to the Mississippi—it might be inferred that, in many species at least, the line of migration is from central Minnesota north and a little westward *to* the valley of the Red River, but not *across* it, and that they follow this valley, reaching Manitoba in advance of those that have come by way of the Plains or the valley of the Missouri River.

The bulk of Purple Grackles arrived at about latitude 40° previous to March 19, most of the advance occurring on the 12th and 13th. During the rest of the month, before the advance was stopped by the snow, the species occupied two more degrees of latitude (to 42°), and by the second week in April it had reached latitude 45°. March 22 was a special day for the movement of bulk, which may account for the great number of firsts recorded March 23 and March 24.

In the fall of 1884 the bulk of Bronzed Grackles left Elk River, Minn., November 1, and the last was seen November 3; the bulk left Des Moines, Iowa, November 8, and the last was seen November 10. At Mount Carmel, Mo., they were present in large flocks (100 to 200) for the first three days of August; they disappeared after August 15; re-appeared in flocks September 14; and five or six were seen December 5.

In the winter of 1884–'85 a few Grackles remained north of their usual winter range. One was seen all winter at Hennepin, Ill.; and at Paris, Ill., a female remained through all the cold season, feeding at a spring near the house of Mr. Balmer. At Mount Carmel, Mo., one was seen February 4, which had probably wintered near there, since no more were seen for a month. In studying the notes on the migration of this species many difficulties are encountered. Two distinct sets of notes were contributed from the region between latitude 38° and latitude 44°. As they do not harmonize any better by supposing that the Rusty Grackle had been confounded with the Bronzed in the east, or the Brewer's mistaken for it in the west, we can but give the two sets and let each reader draw his own inferences. The Bronzed Grackle, under the various names of Purple Grackle, Crow Blackbird, and a variety of Latin names, was reported as having been seen at Mount Carmel, Mo., March 2; Fayette, Mo., March 6; Glasgow, Mo., March 10; Grinnell, Iowa, March 9; Knoxville, Iowa, March 10; Unadilla, Nebr., March 11; Linwood, Nebr., March 10; Bonham, Tex., March 6; Gainesville, Tex., March 14; and Emporia, Kans., March 23. East of the Mississippi it was seen at Canton, Miss., February 24; Shawneetown, Ill., March 3; Paris, Ill., March 5; Aledo, Ill., March 6; Hennepin, Ill., March 13; Fernwood, Ill., March 14; Clinton, Wis., March 27; Lake City, Minn., March 26; New Richmond and Luck, Wis., April 3. Then, going right over the same ground again, we have a second series of notes. At Saint Louis, Mo., a few scattered Grackles were seen March 27; they were the first seen. Regular migration set in at 5 p. m., March 29. The same date the first was seen at Peoria, Ill.

About sunset March 30, March 31, and April 1, thousands and thousands passed Saint Louis in immense flocks. During these same days they were noted for the first time at Keokuk, Richmond, Des Moines, Morning Sun, Coralville. Newton, and Waukon, in Iowa; Manhattan, Kansas; Lanesboro, and Heron Lake, Minn.; Rockford, Ill.; and Milwaukee, Wis. By this time the second wave had overtaken the first, and from stations farther north but one set of notes was received. These show that the first came to Rochester, Minn., April 3; Huron, Dak., April 4; Delavan, Wis., April 5; and that April 6 they reached La Crosse, Green Bay, and Durand, Wis., and Hastings and Elk River, Minn. Our northern border was crossed the middle of the month, and April 15 and 16 they appeared at Ossowo, Shell River, and Oak Point, Manitoba.

In the fall of 1885 the last was reported from Ossowo, Manitoba, October 21; River Falls, Wis., October 10; Grinnell, Iowa, November 21; Iowa City, Iowa, October 25; Des Moines, Iowa, October 14; Mount Carmel, Mo., November 26; and at Bonham, Tex., none were seen after August 16. The whole record from Saint Louis, Mo., is as follows: "September 17, too many present; October 27, a great day for migration, large flocks go south; October 28, another big day, an enormous flock seen at 9 a. m.; October 30, last flock."

512. Quiscalus macrourus. Swains. [275.] *Great-tailed Grackle.*

This species is an inhabitant of eastern Mexico and southern Texas. In the valley of the Lower Rio Grande it is an abundant resident. It was noted at San Antonio, Tex., by Mr. Atwater, who found it there as a summer resident, arriving about the middle of March.

513. Quiscalus major Vieill. [277.] *Boat-tailed Grackle.*

A strictly southern species, confined almost exclusively to the country near the south Atlantic and Gulf coasts, where it breeds abundantly. It is common in Texas and Louisiana, near the coast. It was reported correctly by a few of the most southern observers, and incorrectly by a score or more of the northern observers. All the "Boat-tailed Grackles" north of latitude 33° are Crow Blackbirds and belong to the preceding species. The habit which the male Bronzed Grackle has of carrying his tail "boat-shaped" during the breeding season is the common cause of the mis-identification.

514. Coccothraustes vespertina (Cooper). [165.] *Evening Grosbeak.*

The home of the Evening Grosbeak is in the northwestern part of the United States and British North America, from the Rocky Mountains westward, and while some pass south in winter, even to Mexico, others come eastward and are found in Manitoba and all the northern States as far east as Michigan. They have been found several times in Iowa and Nebraska, but so far there is one record only for Kansas, and that was made in 1877.

The winter of 1883–'84 was marked by an unusual abundance of these Grosbeaks. They came early and stayed late. At Minneapolis, which has long been known as one of their regular winter resorts, the first flock was seen November 7, containing about fifty individuals, and they remained all winter.

During the whole of the winter of 1883–'84 they were very common along the Mississippi River, from Minneapolis to the southern border of the State. They were reported from Minneapolis, Hastings, Red Wing, Lake City, and Lanesboro; in northeastern Iowa from Mitchell, and in central Iowa from Des Moines and Coralville. At Des Moines the bulk left the first week in March, and the last was seen March 23. They came to Lanesboro, Minn., about the middle of February, and by April 3 were among the most common birds in all the woods down the valley of the Root River for a few miles below town. These great numbers reached their height April 19, and even so late as May 13 the birds were still making the woods resound with their noisy notes. East of the Mississippi they were seen at River Falls and Green Bay, Wis. At the latter place they have been known to stay until May 30. At Portage La Prairie, Manitoba, the last was seen May 16.

In the fall of 1884 the first Evening Grosbeak, a male, appeared at Elk River, Minn., October 17; and a flock was seen at Vermillion, Dak., December 24.

In the spring of 1885 they were not nearly so common as during the previous spring. The notes seem to indicate wandering rather than migration. The records are as follows: Milwaukee, Wis., one seen March 28; Lanesboro, Minn., many males and females seen for the first time April 4 and left again in about a week; Heron Lake, Minn., seen March 12 and again the next day; Elk River, Minn., scarce during the winter of 1884–'85, two males seen February 25 and one female March 1. At Shell River, Manitoba, they were seen February 20, when the temperature was 40° below zero. In the fall of 1885 the first was seen at Elk River, Minn., October 30. They had previously been seen at Lanesboro, Minn., October 18, and were still there December 1.

515. Pinicola enucleator (Linn.). [166.] *Pine Grosbeak.*

A winter visitant from the north. All through the winter and spring of 1883–'84 the newspaper press of the country contained accounts of the presence of these birds in the Northern States, and occasionally of the straying of one a little farther south. The comparative rarity of the species and the bright color of the old males make them favorites among collectors, and wherever they go their ranks are rapidly thinned. In the Mississippi Valley they have been found as far south as Kansas (one instance) and Illinois. At Alda, in southeastern Nebraska, Mr. Powell took a female in May, 1882. The winter of 1883–'84 was not marked by special abundance at any point; in fact, the contrary was true, for they were rather less common than usual. They visited Ripon, Wis., and Mitchell, Iowa, and north of these points were seen at most of the stations. They left River Falls, Wis., March 15, and Red Wing, Minn., March 21. At Portage La Prairie, Manitoba, they were seen until April 10.

517. Carpodacus purpureus (Gmel.). [168.] *Purple Finch.*

The Purple Finch breeds in Manitoba and the Upper Mississippi Valley, and is a regular winter resident in the southern portion. The bulk pass the winter south of latitude 40°. At Caddo, Ind. Ter., in the winter of 1883–'84, they did not arrive until the real cold weather came; the first flock was seen January 10, and they were still present March 18. At Gainesville, Tex., an adult male was seen March 20.

The reports show that the species does not move northward with much precision, but arrives at favorite places long before it is seen at neighboring stations. For this reason no exact dates of movement can be given, and it can only be said that the species began to move out of winter quarters March 20 to 25, and that during the last week of March and the first week of April it passed up to latitude 45°; but during March a few individuals were found close to the Mississippi as high as latitude 44° 30′. On April 21 it appeared at Portage La Prairie, Manitoba. It breeds regularly from northern Minnesota and Dakota northward, but has also been found breeding in northern Illinois. Mr. Kline has taken one set of eggs at Polo, Ill.

To show how the composition of the flocks changes from time to time in the same place, we can do no better than reproduce Mr. Widmann's record from Saint Louis:

> During the winter of 1883–'84 flocks were found at their old stand. There were not so many as in the winter of 1882–'83, and crimson and plain birds were almost equally numerous. In cold weather they keep mostly on the ground, feeding on seeds of ash; in warm weather they ascend to the tree tops to feed on buds. February 23 there was a change in the flocks; they became larger, but there was a decrease in the number of crimson birds (that is, the old males), 75 per cent. being brown birds, the balance light crimson. March 17, flocks excited, mostly of brown birds, but singing. March 27, the bulk departed. April 19, the species still present in small flocks, mostly brown, but singing much. April 28, last regular migrants. May 5, an accidental party of eight or ten, all brown; May 7, a single brown bird seen.

During the winter of 1884–'85 a few Purple Finches were seen at Saint Louis, Mo., and at Shawneetown, Ill. At Des Moines, Iowa, a large flock was noted February 25, but no more were observed until regular migration began in March. The first migrants appeared at Saint Louis, March 3; Des Moines, March 14; Lanesboro, Minn., March 22; Hastings, Minn., March 31; Rockford, Ill., April 1; Green Bay, Wis., April 2; and Shell River, Manitoba, April 30. The whole record for 1885 at Saint Louis is:

> February 27, three brown individuals seen, winter visitants; March 3, first migrants, five, crimson; March 11, slight increase, scattered; March 31, first large flock, many crimson, and in full song; April 6 to April 16, bulk present; April 27, last.

In the fall of 1885 the first came to Green Bay, Wis., September 15; Lanesboro, Minn., October 17; and Mount Carmel, Mo., October 7.

The last was seen at Mount Carmel November 2. The first came to Saint Louis, Mo., September 17, and an increase was noticed October 17.

518. Carpodacus cassini Baird. [169.] *Cassin's Purple Finch.*

The usual home of this species is in the Rocky Mountain region, but it occurs in Texas. In the spring of 1884, at Gainesville, Tex., Mr. Ragsdale saw the first March 13.

521. Loxia curvirostra minor (Brehm). [172.] *American Crossbill.*

Both the Red and the White-winged Crossbills breed and are resident in Minnesota, and in winter come a little farther south, occasionally as far as Kansas. Though noted by the observers in their lists, yet not a single record was made during the winter of 1883–'84.

How different the record for 1885! The winter of 1884–'85 was marked ornithologically, in the Upper Mississippi Valley, by the great abundance of Crossbills of both species. They arrived at Paris, Ill., the middle of November (1884); increased daily, and in December the flocks contained from thirty to fifty birds. None were seen during January (1885), but they were in good force again February 3. The bulk departed in April, and the last were seen during the first week in May. At Shawneetown, Ill., the first came December 24, 1884; they were next seen March 25, and again April 2. No regular migratory movement can be traced, but they seem to have been most common in Wisconsin and Illinois the last week of March and the first half of April, and to have left early in May. In Milwaukee, thirty-nine birds were brought to one taxidermist March 28, and they were abundant for the next three weeks at Lake Mills, Wis. Several hundred were seen during the spring at Jefferson, Wis., and they were also noted at Durand, Green Bay, Ripon, Delavan, and Clinton, in Wisconsin, and at Rockford, Hennepin, and Odin, in Illinois. In Iowa they stayed all winter at Coralville, and were seen April 18 at Knoxville (fifty birds) and May 1 at Grinnell. The latest records are: Hennepin, Ill., May 18; Coralville, Iowa, May 21; and Milwaukee, Wis., May 25. Many of both species of Crossbills were seen at Elk River, Minn., the last week in March. In the fall of 1885 a flock re-appeared at Milwaukee, Wis., November 7.

521 a. Loxia curvirostra stricklandi Ridgw. (172 *a.*) *Mexican Crossbill.*

In the fall of 1885 numbers of these southwestern Crossbills invaded eastern Kansas. November 5 Prof. L. L. Dyche shot several from a small flock at Lawrence; November 21 Prof. D. E. Lantz killed three out of a flock of twelve at Manhattan; and December 23 Mr. V. L. Kellogg shot a pair out of a flock of twelve at Emporia (Revised Cat. Bds. Kansas, Goss, 1886, p. 40). At Lawrence Professor Dyche first observed the birds November 1 (1885), and he last saw them January 26 (1886). During this period he secured forty specimens, twenty of each sex. (The Auk, Vol. III, 1886, pp. 258–259).

522. Loxia leucoptera Gmel. [173.] *White-winged Crossbill.*

As noted under the Red Crossbill, no White-winged Crossbills were observed in the Mississippi Valley during the spring of 1884, but in the fall of that year they appeared at Elk River, Minn., and remained during the winter. In the spring of 1885 they were not so common as the Red Crossbill, but were noted at Durand, Wis., March 29; at Peoria, Ill., March 30; at New Richmond, Wis., April 3, and about a hundred were seen at Elk River, Minn., March 4. In Kansas it is a rare and irregular winter visitor (Goss).

524. Leucosticte tephrocotis Swains. [175.] *Gray-crowned Leucosticte.*

Breeds chiefly in the Rocky Mountain region north of the United States; south in winter to Colorado. According to Professor Aughey it is "frequently seen in Nebraska in winter, but rarely, if ever, in summer."

527 a. Acanthis hornemannii exilipes (Coues). [178*a.*] *Hoary Redpoll.*

Another Arctic bird which visits the Mississippi Valley in fall and winter. Mr. Seton (now Thompson) gave it as a tolerably common fall visitant to the Big Plain in Western Manitoba. It has been taken in northern Illinois.

528. Acanthis linaria (Linn.). [179]. *Common Redpoll.*

A winter visitant from the far north. The winter home of the Redpoll in 1883–'84 seems to have been confined principally to the country between the parallels of 41° and 44°, though the year before it was seen south to southern Illinois (at latitude 37° 30′). It is usually a winter visitor at Elk River, Minn., but Mr. Vernon Bailey writes that he saw none there from December 25, 1883, to January 17, 1884, when the temperature was 35° below zero. In the latter part of February the flocks began to grow restless and spread a little, and the first week of March the southernmost birds were crowding north. By March 10 all had gone. The first was recorded from Frazee City, Minn., on April 19, but probably reached that latitude a few days before. At Elk River, Minn., the species was numerous and many individuals migrated on April 3, and on April 7 the last one was seen. In the southern part of the State, at Lanesboro, the bulk and the last left March 29. At Portage La Prairie, Manitoba, the last was seen April 21.

In the fall of 1884 the first flock of Redpolls appeared at Elk River, Minn., November 1; the bulk arrived six days later, and they were common all winter.

In the spring of 1885 the Redpolls remained in the Mississippi Valley much later than in 1884. They were noted from Mount Carmel, Mo., April 1; Grinnell, Iowa, April 25; and Leeds Centre, Wis., May 9. In the fall of 1885 they reached Mount Carmel, Mo., November 4.

528 a. Acanthis linaria holbœllii (Brehm). [179 *a.*] *Holbœll's Redpoll.*

Another northern species of rare or casual occurrence in the Mississippi Valley. Mr. Ridgway kindly informs me that he has examined specimens from northern Illinois.

528b. Acanthis linaria rostrata (Coues). [179*a*.] *Greater Redpoll.*

A northern species, rarely seen in the United States. The only instance of its capture within the Mississippi Valley is the record of a specimen taken November 2, 1878, at Chicago, Ill., by Mr. H. K. Coale.

529. Spinus tristis (Linn.). [181.] *American Goldfinch.*

The Thistle-bird or American Goldfinch is found in winter over most of the United States, and breeds throughout the greater part of its range except in the southernmost portions. In the winter of 1883–'84 it was reported from various stations up to northern Illinois, southern Minnesota, and southeastern Dakota. Considering the severity of the winter it is not to be wondered at that it was found no farther north, but had it been a mild, open winter, like that of 1877–'78, it would have remained almost at our northern boundary. About the middle or latter part of March records began to appear at points within their usual winter range where they had not been seen during the cold weather, showing that at this date the birds began to spread from their winter quarters. But it was late before the species began to advance beyond its ordinary winter limits. It seems not to have made up its mind to migrate until the last week in April, and then it was two weeks in getting fairly started. In Wisconsin the first came to West Depere May 14; in Minnesota they appeared at Pine Bend May 24. May 28 the species was seen at Portage La Prairie, Manitoba; the next day one was seen as far north as Oak Point, Manitoba. By far the larger part of the movement of this species took place in the last few days of April and the first days of May. The record from Saint Louis furnishes a full account of the movements from about the latitude in which the bulk winters. It was seen all winter in many places—not in flocks, but as scattered single birds.* These birds were very quiet, keeping on or near the ground, generally in company with Tree Sparrows, and all in plain winter dress. The first flock came February 24; they were in song. They remained in about the same numbers for more than a month; March 22 a flock of transients was seen going north. April 27 a flock of males in high dress began to arrive; the next day there was an increase from the arrival of the bulk of the males of the summer residents and transients; there were then more males than females. April 29 they were numerous and noisy, singing males attracting passing males which were seen descending. Another day and they were at the height of the season, Goldfinches everywhere, both males and females. May 5 the bulk of the males left; three days later the bulk of the females followed, and by May 10 the summer residents were in pairs and quiet reigned.

In the fall of 1884 the last Thistle-bird was seen at Mount Carmel, Mo., December 10; but none were noted at San Angelo, Tex., after September 7. Some of them remained north very late. They were quite abundant at Lanesboro, Minn., January 1, 1885, and were common at Minneapolis, Minn., during January. They left this latter place in February and did not return until March 29.

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* At Manhattan, Kans., directly west of Saint Louis, a thousand were seen in a single day, January 12.

In the spring of 1885 the records were very irregular, doubtless because of the erratic movements of the birds. Few, if any, remained during the entire winter north of latitude 39°; and though they began to move from place to place early in March, the bulk of their migration was performed in May. They reached Shell River, Manitoba, May 24. The whole record from Saint Louis is as follows:

> March 3, first, five in plain dress, silent; March 4, another party of six; March 5, a very large flock in the lowlands of Illinois, opposite Saint Louis; March 11, a few in much brighter colors and musical; April 10, still very scarce; only twice met since March 11; April 20 and 21, increasing, flocks of males in high dress; April 22, bulk arrived of both males and females; April 29, height of the season, large flocks; May 4, the bulk of transients departs; May 5, summer residents are scattering and mating.

In the fall of 1885 the records of "lasts" were: Green Bay, Wis., November 2; Milwaukee, Wis., November 26; and Mount Carmel, Mo., December 12. At Saint Louis, Mo., the bulk was still present October 10. At Gainesville, Tex., the first was seen August 7.

530. Spinus psaltria (Say). [182.] *Green-backed Goldfinch; Arkansas Goldfinch.*

The range of this western species within our district is limited to western Texas. It was only noted by Mr. Lloyd, who states that at San Angelo, Tex., it is a rare fall migrant.

530 a. Spinus psaltria arizonæ (Coues). [182 *a.*] *Arizona Goldfinch.*

An inhabitant of northern Mexico, Arizona, and Texas.

530 b. Spinus psaltria mexicanus (Sw.). [182 *b.*] *Mexican Goldfinch.*

More than forty years ago Giraud claimed to have found this species in Texas. This record has been questioned, but its trustworthiness has been recently established by the Rev. Ira B. Henry, who re-discovered the species at Mason, Tex., where it is a rather common summer resident. A specimen sent to the Smithsonian Institution was pronounced to agree very closely with Giraud's type as undoubtedly *mexicanus.*

533. Spinus pinus (Wils.). [185.] *Pine Siskin; Pine Goldfinch.*

In Forest and Stream of December 7, 1882, Dr. Coues made the following statement concerning the habitat of this species:

> They breed throughout the British Provinces, northern Maine, New Hampshire, Vermont, New York, Michigan, and thence to Washington Territory in all the evergreen forests, and also breed in the Alpine regions of Oregon, California, Utah, Nevada, Idaho, Wyoming, Colorado, Arizona, Nevada, and New and Old Mexico. Some individuals may be found the year through in their summer abodes, while others spread in winter over all the United States in suitable places, unless the South Atlantic and Gulf States are to be excepted.

During the winter and spring of 1883-'84 and 1884-'85 they were observed at odd times at several of the stations, but their movements were so irregular as to preclude any definite tracing or timing of their migration. Colonel Goss shot two from a small flock near Wallace, Kans., May 29, 1883; and others were seen at Manhattan, Kans., as late as May 16, 1885.

Passer domesticus (Linn.). [——.] *European House Sparrow; English Sparrow.*

In Texas the English Sparrow is abundant at Galveston, Houston, and other points about Galveston Bay. In Louisiana it is common in the southeastern part of the State, and extends northward along the Mississippi as far as Saint Joseph. In Mississippi it is confined to the northern half of the State, and is said not to occur so far south as Vicksburg or Jackson. North of this region, and east of the Mississippi River, it occupies the whole of the Mississippi Valley up to latitude 45°. West of the Mississippi River it occurs in eastern Arkansas, north of the Arkansas River; is abundant over most of Missouri (except in the Ozark Hills), and Iowa (except the northwestern corner), eastern Kansas, eastern Nebraska, and southeastern Minnesota, and was reported from a single place in Dakota (Milltown). It generally appears first in cities and towns, whence it extends its incursions to the smaller villages and the surrounding country, until finally it locates and breeds about farm buildings often many miles from any town. It is an enemy to agriculture.

Passer montanus (Linn.). [——] *European Tree Sparrow.*

Successfully naturalized in the vicinity of Saint Louis, Mo., where it is now abundant and on the increase.

534. **Plectrophenax nivalis** (Linn.). [186.] *Snow Bunting; Snowflake.*

From their breeding places within the Arctic Circle these warm-blooded Snowflakes come in countless thousands, beautifying and enlivening many a dreary winter landscape with the quick flashing of their wings and their cheery chatter. They commonly invade all of our district north of latitude 39°, and less often south to latitude 35°, where they are replaced by the Lapland Longspur. They are rare in Kansas (Goss). Most of the notes of our observers refer to their departure in the spring. At Saint Louis they have never been seen, and they are rare in Kansas. At White Hall, Ill., in the spring of 1884, they stayed until March 24. A little farther north, near latitude 42° and latitude 43°, they were seen as late as April 17, though the bulk left the first week in April. At latitude 45° the bulk left about the same time, but it was nearly May 1 before the last one departed. At Portage La Prairie, Manitoba, they did not disappear until May 25, and on previous years have been seen as late as June 22 when the weather was very hot.

In the fall of 1884 the first Snow Bunting appeared at Elk River, Minn., October 24, and the bulk arrived there November 11. At Lake Mills, Wis., the first was reported December 17. At Mount Carmel, Mo., the first was seen December 22, and the species became common four days later. A few were seen at Chicago, Ill., December 6.

In the spring of 1885 the last were reported from Chicago, Ill., March 14; Mount Carmel, Mo., March 24; Grinnell, Iowa, April 25, and Argusville, Dak., April 29.

In the fall of 1885 they returned to Elk River, Minn., October 9; Argusville, Dak., October 19, and Milwaukee, Wis., December 20.

536. **Calcarius lapponicus** (Linn.). [187.] *Lapland Longpsur.*

Like the last, a winter visitant from the far north. As has been already stated, the Mississippi Valley below the range of the Snow Bunting is occupied by the Longspur. In Kansas it is abundant. The limit of its known southern range has been carried south until we now know that it penetrates to Texas, where it has been found at Gainesville, leaving there in 1884 about March 1. Its mode of occurrence at Caddo, Ind. Ter., in the winter of 1883–'84 may be taken as a fair example of the way it comes and goes at pleasure. None were seen until a sudden cold snap in February covered everything with frozen rain. Horned Larks, Smith's Longspurs, and Chestnut-collared Buntings became abundant, and February 13 three Lapland Longspurs were seen. Starting out the next day to secure some of their skins I suddenly found myself surrounded by hundreds and hundreds of them. They fairly swarmed for a week; but on the night of February 19, taking advantage of a clear sky and a south wind, they disappeared, in company with all their long-clawed brethren, as suddenly as they had come. In Kansas they were very numerous about the same time, and a month later Nebraska became the scene of action for the evolutions of their mighty armies. In northern Minnesota they disappeared during the winter to give place to the Snow Buntings; and the first ones returned to Frazee City March 9. The last left Manhattan, Kans., March 22, while as late as April 19 thousands were seen at Chicago, but they left almost immediately afterward.

In the spring of 1885 the last flocks of Lapland Longspurs left Manhattan, Kans., February 21. At Newton, Iowa, large flocks moved north regularly every fine day from March 1 to March 12; and the last were seen there April 22. A large flock in spring dress was seen in Lanesboro, Minn., May 2, and the last at Heron Lake, Minn., May 9.

In the fall of 1885 a small flock was seen at Mount Carmel, Mo., November 2, and again November 20. The first was seen at Gainesville, Texas, November 14. In northwestern Manitoba the Lapland Longspur is "enormously abundant in May and September." (Seton, The Auk, Vol. II, 1885, p. 23.)

537. **Calcarius pictus** (Swains.). [188.] *Smith's Longspur.*

Smith's Longspur breeds in the far north and winters in the western part of the Mississippi Valley. It is common in southern Kansas, and its winter journeyings have been lately discovered to extend to Texas, where Mr. Ragsdale has found it at Gainesville during several winters. In the spring of 1884 the bulk left Gainesville March 5, and one was seen April 1. At Caddo, Ind. Ter., a little to the northeast of Gainesville, in a strictly prairie country, they were found to be an abundant and apparently regular winter visitor. Two flocks and many scattered birds were seen November 17, when there was hardly a sign of approaching winter and the leaves had not all fallen from the trees. They stayed through heat and cold, ice, snow, and rain, until the bulk left February 19, and the last on the 26th. East of the Mississippi the species extends in winter to the prairie regions of southern Wisconsin and northern Illinois, but its true home is in the extensive plains of the west and northwest. It does not breed within our limits. At Caddo a fine male was shot while sitting on a tree, the only one that was ever seen to alight elsewhere than on the ground.

In the spring of 1885 a specimen of Smith's Longspur was shot at Fayetteville, Ark., February 28, and sent to me for identification. At Des Moines, Iowa, about 50 were seen April 18. In the fall of 1885 the known winter range of the species was slightly extended to the southeastward by its appearance, November 10, at Bonham, Tex., where it was common November 16. At Gainesville, Tex., the first was seen November 14. In Manitoba it is abundant during the migrations, particularly in spring.

538. Calcarius ornatus (Towns.). [189.] *Chestnut-collared Longspur.*

This is one of the most abundant birds of the western Plains. It is resident in western Kansas and Nebraska, breeding north to high latitudes in summer, and wandering to southwestern Texas and Mexico in winter. In Manitoba it is a common breeder, but is somewhat local. It breeds commonly in Grant and Traverse Counties, in western Minnesota (Roberts & Benner). The most southeastern record probably is that from Warrensburgh, Mo., where it was rather common in April, 1874. (Scott, Bull. Nutt. Ornith. Club, Vol. IV, 1879, p. 143.) At Caddo, Ind. Ter., it was seen in the middle of February, 1884, in company with *C. pictus* and *C. lapponicus*. A question of the use and meaning of ornithological terms arises in connection with this and the following species. Mr. N. C. Brown, in his "Reconnaissance in southwestern Texas" (Bull. Nutt. Ornith. Club, Vol. VII, 1882, pp. 37–38), says that these two species, *C. ornatus* and *R. mccownii*, do not winter there because not found until February, and that the latter species is an uncommon migrant, taken between February 11 and 21. In our Mississippi Valley work we would call both of these species winter visitants, restricting the term "migrant" or "transient," which two terms are here used synonymously, to those birds which are found only as they pass through from a more southern to a more northern dwelling-place, or *vice versa*. At Gainesville, Tex., the bulk of the Chestnut-collared Longspurs began to leave March 12, and the last was seen April 24.

In the fall of 1884 a single Chesnut-collared Longspur appeared at Gainesville, Tex., November 3.

In the spring of 1885 they were common at Gainesville, Tex., March 5, and some may have wintered there. At Huron, Dak., the first were seen April 2; and at Menoken, Dak., April 15. A single bird was seen at Heron Lake, Minn., May 9. Dr. Agersborg states that it breeds sparingly in southeastern Dakota and abundantly 150 miles farther north.

539. Rhynchophanes mccownii. (Lawr.). [190.] *McCown's Longspur.*

This Longspur is more emphatically a bird of the western Plains than any of the preceding. There is only one record of its occurrence east of the Mississippi, it having been found accidentally at Champaign, Ill. The ordinary eastern limit of its range is near the edge of the Plains, in Dakota, Nebraska, western Kansas, and Texas. It does not go so far north as the other species, the Black Hills being near its northern limit. It breeds abundantly in west-central Dakota (Allen). It was found at Caddo, Ind. Ter., January 19, 1884. At Gainesville, Tex., it was recorded as a winter resident, leaving March 12; a small flock was seen March 26, an unusually late date. In western Texas it is an abundant winter resident (Lloyd). At Ellis, Kans., it was found to be a winter visitant and abundant in migration, but whether or not it breeds has not yet been determined.

In the fall of 1884 a flock of ten McCown's Longspurs appeared at Gainesville, Tex., November 5.

In the spring of 1885 two females were shot at Gainesville, April 9, and were the last seen.

In the fall of 1885 the first returned to Gainesville October 27, and it was common by November 2.

540. Poocætes gramineus (Gmel.). [197.] *Vesper Sparrow; Grass Finch.*

A common breeder from eastern Manitoba to southern Illinois, and a common migrant throughout the Southern States. In the eastern part of Concho County, Tex., Mr. Lloyd states that it is a tolerably common fall migrant. In northeastern Texas, at Gainesville, it was not found in winter; which fact agrees with Mr. Nehrling's statement, that none remain, so far as he knows, in the vicinity of Houston, Tex., during the winter. (Bull. Nutt. Ornith. Club, Vol. VII, 1882, p. 12.) At Gainesville they arrived March 4, and were seen until April 16. Just north of Gainesville, at Caddo, Ind. Ter., a single bird was seen February 25, but no more until the bulk came March 11. There is some doubt whether these Gainesville specimens are typical *gramineus* or the western subspecies *confinis*, but those from Caddo were certainly typical. At Pierce City, Mo., the first came March 17, and March 22 a pair visited Saint Louis. Then there was a pause, and the species apparently made no advance until the first week in April. April 10 it was seen at Lanesboro, Minn. It ranges north even to the Saskatchewan

River. It was reported as breeding at Newport, Ark., but its normal breeding range does not extend much south of southern Illinois.

In the fall of 1884 the last Grass Finch left Des Moines, Iowa, August 12, and the first appeared at Gainesville, Tex., October 8.

In the spring of 1885 a pronounced migration of this species took place about the 1st of April. It was first noticed at Saint Louis, Mo., March 30; at Hennepin, Ill., March 31; Delavan, Wis., April 1; and Manhattan, Kans., April 4. The Texas records were later. They are: Gainesville, April 6, and San Angelo, April 14. The advance near the Mississippi River was quite uniform. Newton, Iowa, was reached April 9; Leeds Centre, Wis., April 10; Lanesboro, Minn., April 16; New Richmond, Wis., April 14; Minneapolis, Minn., April 22; and Shell River, Manitoba, April 29. In the fall of 1885 the last one was seen at Elk River, Minn., October 3; Lanesboro, Minn., October 29; Saint Louis, Mo., October 21; and at Mount Carmel, Mo., October 28. At Gainesville, Tex., they were abundant November 17.

540 a. Poocætes gramineus confinis Baird. [197 *a.*] *Western Vesper Sparrow.*

This pale form of the Vesper Sparrow occurs on the high dry plains along our western border, and thence westward. Its eastern limit in the south is in the neighborhood of Gainesville, Tex., where specimens both of this subspecies and of typical *gramineus* have been taken by Mr. Ragsdale. Most of the specimens from Gainesville are intermediate in character, but from the one hundredth meridian westward, in Texas, typical *confinis* is the prevailing form. It breeds in western Texas (Lloyd). It is an abundant summer resident at Devil's Lake, Dak., and is the common form in central Dakota, as well as in the Traverse Lake region in western Minnesota, and throughout western Manitoba.

541. Ammodramus princeps (Mayn.). [192.] *Ipswich Sparrow.*

Breeds on Sable Island, off Nova Scotia, and occurs in winter along the Atlantic coast as far south as Virginia. A single straggler has been reported from Dallas, Tex., where, according to its label, it was killed December 10, 1884 (Sennett, The Auk, Vol. III, 1886, p. 135), but there is reason to suspect that the specimen really came from the coast of New England, the error having arisen from a transposition of labels.

542 a. Ammodramus sandwichensis savanna (Wils.). [193 *a.*] *Savanna Sparrow.*

This Sparrow breeds throughout the Mississippi Valley east of the Plains. It is said to winter from southern Illinois and southern Kansas southward, but none of the observers found it north of latitude 35°. It was found most abundantly about Caddo, Ind. Ter., and Gainesville, Tex., at which places both the typical species and the paler form, *A. alaudinus*, occur (one form remains abundant all winter, the other comes early in the spring). February 14, these Sparrows were very common at Caddo, Ind. Ter., though not more than five were found in a place. The morning of March 22 they were truly in the "height of the season." It had not been supposed that they ever appeared in such numbers.

Within a half mile from the house there were certainly not less than a thousand, and probably over two thousand, individuals. They could be seen and heard on all sides all the time. The next day the numbers remained the same, while the day following a walk over the same ground revealed two birds only. Considering the winter bird to be *alaudinus*, Mr. Ragsdale did not record *savanna* from Gainesville until April 7 and the last May 14.

Nearer the Mississippi they reached Pierce City, Mo., March 19, and Saint Louis March 22; but this bird was ahead of his mates, for less than half a dozen were seen before April 19. Des Moines, Iowa, was reached April 23, and Lanesboro, Minn., on the last day of the month. At Manhattan, Kans., directly north of Gainesville, it arrived April 21. The Savanna Sparrow usually breeds from latitude 40° northward, but Mr. Ridgway states that it breeds throughout Illinois, and Mr. Nehrling has found it breeding at Pierce City, Mo. Dr. Watson thinks that in former years he found it nesting at Ellis, Kans.

In the spring of 1885 not a note on the Savanna Sparrow came from any station east of the Mississippi River. At Manhattan, Kans., the first was seen April 1; Saint Louis, Mo., April 7; Grinnell, Iowa, April 22; Waukon, Iowa, May 4; Heron Lake, Minn., May 9; Huron, Dak., May 4, and White Earth, Minn., May 16. In the fall of 1885 the last was seen at Grinnell, Iowa, September 27, and the first at Emporia, Kans., October 10.

542 b. Ammodramus sandwichensis alaudinus (Bp.). [193 *b.*] *Western Savanna Sparrow.*

Common on the Great Plains and in western Manitoba. Mr. Ragsdale regards this form as the winter resident at Gainesville, Tex., where in 1884 it was most abundant February 26. By April 29 all had gone. In western Texas Mr. Lloyd determined it to be a common resident. Colonel Goss has taken it in western Kansas.

545. Ammodramus bairdii (Aud.). [191.] *Baird's Bunting.*

Baird's Bunting breeds in western Manitoba, Dakota, and western Minnesota. By what route it goes south is a question. Doctor Coues, writing ten years ago, said that it was extremely abundant in Dakota almost to the Red River of the North, and that all left in September. Where did they go? The species is not known to occur in Kansas; and if there is a Nebraska record I have failed to find it. Nevertheless, we are bound to believe that it does occur in both these States. Mr. G. H. Ragsdale shot one at Gainesville, Tex., April 24, 1884, and if it occurs in central Texas and Dakota it must perforce occur in the intervening country. At Caddo, Ind. Ter., it was not found, though I shot upwards of fifty Savanna Sparrows in the vain hope that some one of them would resolve itself into the wished-for Baird's. On March 31, among a lot of Savannas, I heard one singing with the trill at the end which

Doctor Coues says is the note of this species, but I was not able to find the bird. Its range is from New Mexico to British America, and it breeds abundantly in Dakota, along the Red River in Minnesota, and in Manitoba (particularly on the Alkaline flats along the Assiniboine River.—Seton).

In the spring of 1885 Baird's Bunting was not recorded from Kansas and Nebraska; but Mr. Lloyd found it to be a common winter resident at Fort Davis, Tex. It was noted in migration at Grinnell, Iowa, April 25; Menoken, Dak., May 12, and White Earth, Minn., May 16—at which latter place one was caught alive and kept in confinement for several days. At Grinnell, Iowa, it occurs in fall as well as spring.

546. **Ammodramus savannarum passerinus** (Wils.). [198.] *Grasshopper Sparrow; Yellow-winged Sparrow.*

Unlike most of the true Sparrows this bird does not go far north, scarcely reaching our northern boundary, and the great bulk remain from Iowa and Illinois southward, though it does breed in southeastern Dakota and western Minnesota. It is an abundant summer resident in Kansas. Its winter home is in the Southern States, and it has been found in winter as far north as southern Illinois. During the winter months it must be a very rare bird in Texas. Mr. Nehrling found a few at Houston. Mr. Brown, at Boerne, did not see one until February 14. Mr. Lloyd, at San Angelo, Tex., has never seen it in winter, nor has Mr. Ragsdale, at Gainesville. It was determined to be a very rare and probably accidental winter bird at Caddo, Ind. Ter., where, in the winter of 1883–'84, it was found in company with Lincoln's Sparrow; less than half a dozen individuals were seen previous to March 15, and by April 1 it was just beginning to be common. None were seen at San Angelo, Tex., until April 7, nor in the latitude of Gainesville until March 31, although in former years Mr. Ragsdale had found them March 8 to 10. A single straggler was seen at Manhattan, Kans., March 22, but the bulk did not come until May 1. April 30 they were seen at Saint Louis, and May 2 brought them to Alda, Nebr. Farther north than Alda but one record was made. This was at Chicago, Ill., where it was seen May 21.

In the fall of 1884 the bulk of the Yellow-winged Sparrows left Mount Carmel, Mo., September 15, while the last was not seen until October 12. At San Angelo, Tex., the first migrant appeared September 28.

In the spring of 1885 the first at San Angelo, Tex., was seen March 21; at Knoxville, Iowa, April 5; Des Moines, Iowa, April 13; Manhattan, Kans., April 18; Unadilla, Nebr., April 18; Newton, Iowa, April 21; Grinnell, Iowa, April 22; Saint Louis, Mo., April 27, and Lanesboro, Minn., May 2.

In the fall of 1885 the last at Grinnell, Iowa, was seen October 17; at Des Moines, Iowa, October 24, and at Saint Louis, Mo., September 14. At Gainesville, Tex., the first was seen November 2.

546 a. Ammodramus savannarum perpallidus Ridgw. [198 *a.*] *Western Grasshopper Sparrow.*

Rather common on the Great Plains from Dakota southward. Mr. Lloyd states that it is a resident in western Texas, and is tolerably common in fall in Concho County. A single specimen was killed at Boerne, Tex., by Mr. Brown. (Bull. Nutt. Ornith. Club, Vol. VII, 1882, p. 127.) Mr. Ragsdale writes that those taken at Gainesville, Tex., are intermediate in character, but nearer this subspecies than the typical form.

547. Ammodramus henslowii (Aud.). [199.] *Henslow's Sparrow.*

This is one of the rarer Sparrows of the Mississippi Valley. Ridgway says it is a common species on weedy prairies in Illinois, where it breeds, and in the southern part of which State it sometimes winters. It has been found in Kansas and Nebraska, and from thence southward. Mr. Scott found it breeding in western Missouri. (Bull. Nutt. Ornith. Club, Vol. IV, 1879, p. 143.) The only observer who has had the good fortune to meet it is Mr. Ragsdale, who recorded it as uncommon at Gainesville, Tex., where it was seen February 27, 1876.*

548. Ammodramus leconteii (Aud.). [200.] *Le Conte's Sparrow.*

This species is common over the western prairies, but is seldom noticed because of its habit of skulking in the grass, where it manages to keep well out of sight. It breeds in the Assiniboine Valley and in Dakota and Minnesota, and possibly in Illinois. In winter it ranges south through all the States west of the Mississippi to Texas, and has been found in numbers in Illinois, South Carolina, Alabama, and even in Florida. In the spring of 1884 Caddo, Ind. Ter., was the only station at which it was seen. Here its passage, for it did not winter, was very rapid. February 16 over a dozen were seen; two days afterwards the pastures were alive with them. A 640 acre field was as full of them as northern fence-rows ever are with Chipping Sparrows. Many left the night of February 19, and by March 1 all had departed. The nest and eggs of this species have been described by Ernest E. Thompson, from Manitoba (The Auk, Vol. V, 1885, p. 24), and by Dr. Agersborg, from Vermillion, Dak. (*Ibid.*, Vol. V, p. 280), but the two accounts are so entirely at variance that the question must wait for future settlement.

In the fall of 1884 the first Le Conte's Sparrow was seen at Gainesville, Tex., October 27.

In the spring of 1885 a Le Conte's Sparrow, which had been impaled by a Shrike, was sent me for identification from Fayetteville, Ark., where it was found February 28. At Saint Louis, Mo., one was shot April 1; it had not previously been known from that place. At Newton, Iowa, one was taken April 20.†

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* Since the above was written, Mr. Lynds Jones has found Henslow's Sparrow to be a tolerably common breeder at Grinnell, Iowa.—C. H. M.

† At Storm Lake, Iowa, during the latter of September, 1887, Dr. A. K. Fisher found Le Conte's Sparrow common, and secured specimens not yet wholly out of "first plumage," showing that they had been hatched in the neighborhood.—C. H. M.

In the fall of 1885 the first at Emporia, Kans., was seen October 2. It was not noticed at Gainesville, Tex., until November 30. It is a common fall migrant at Manhattan, Kans.

549. **Ammodramus caudacutus** (Gmel.). [201.] *Sharp-tailed Sparrow.*

An inhabitant of the salt marshes of the Atlantic and Gulf coasts. Mr. Nehrling said of its occurrence in southeastern Texas: "Observed near the coast of the Gulf of Mexico and Galveston Bay. Doubtless breeds." (Bull. Nutt. Ornith. Club, Vol. VII, 1882, p. 12.)

549 a. **Ammodramus caudacutus nelsoni** Alln. [201 *a.*] *Nelson's Sharp-tailed Sparrow.*

This bird is known principally from the Mississippi Valley, but is rare and local. It has been taken as a rare summer resident in eastern Kansas, and probably breeds in southern Kansas. It breeds in northern Illinois and probably winters in southern Illinois. It has been taken at Saint Louis, Mo.*

550. **Ammodramus maritimus** (Wils.). [202.] *Seaside Finch; Seaside Sparrow.*

An inhabitant of the salt marshes of the Atlantic and Gulf coasts, from Massachusetts to Texas.

552. **Chondestes grammacus** (Say). [204.] *Lark Finch.*

This Sparrow is a prairie bird, and it occurs as far east as the prairies extend across Iowa, Illinois, Wisconsin, Ohio, and Texas (even to the neighborhood of Houston in southern Texas, where it breeds abundantly.—Nehrling). It is rare in Manitoba. Dr. Agersborg states that at Vermillion, Dak., three broods are often raised in a season. It winters quite far south, being found in Mexico; a few winter in southern Texas. In Kansas it is an abundant summer resident. Its migration is late but rapid. In the spring of 1884, at Gainesville, Tex., it appeared April 5. By April 17 it had covered southern Missouri and southern Illinois to latitude 39° 19′. April 24 it had reached latitude 42° in Iowa, and April 30 it was seen at Waukon, Iowa, and Vermillion, Dak. May 3 and May 4 it appeared at Lanesboro, Minn., and West Depere, Wis., but north of these points the records were not regular enough to be of value. Computation based on the above data shows that the species migrates at an average rate of about 30 miles a day over a distance of nearly a thousand miles. The average of the records indicate that the arrival of the bulk is about six days behind that of the first.

In the fall of 1884 the bulk of the Lark Finches left Mount Carmel, Mo., August 20, and the last were seen there a week later.

In the spring of 1885 no records came from the stations east of the Mississippi River. The average speed of migration of this species in

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* Mr. Vernon Bailey has recently found it breeding at Fort Sisseton and Devil's Lake, Dak.—C. H. M.

1885 was even greater than in the previous year. It reached Gainesville, Tex., March 28; Saint Louis, Mo., April 16; Manhattan, Kans., and Des Moines, Iowa, April 18. April 20 and 21 it appeared at Newton, Iowa; Laporte City, Iowa; Lanesboro, Minn., and Lake City, Minn. Mr. Atwater says that at San Antonio, Tex., they always nest in trees, probably for protection against snakes. At Red Rock, Ind. Ter., I used to find them more often on trees than on the ground, while at Manhattan, Kans., Prof. Lantz says they usually nest on the ground, but occasionally in trees. In the fall of 1885 the last at Grinnell, Iowa, was seen September 27, and at Mount Carmel, Mo., October 17. The first arrived at Bonham, Tex., October 17, and they were common there October 22.

552 a. Chondestes grammacus strigatus (Swains.). [204 *a.*] *Western Lark Finch.*

Mr. Lloyd states that this subspecies is an abundant summer resident in western Texas, where it raises two broods, nesting in bushes and on the ground. The most eastern record within our district is from Gainesville, Tex., where Mr. G. H. Ragsdale secured it. But the majority of the specimens from that locality are intermediate in character. At San Angelo, in 1884, it was first seen April 1, and last seen October 3. In 1885 it reached San Angelo March 24.

553. Zonotrichia querula (Nutt.). [205.] *Harris's Sparrow.*

The habitat of this species has lately been determined with much more accuracy than formerly; indeed, the larger part of our knowledge of Harris's Finch has been obtained during the last twelve years. Its eastern limit is well known; there is no Louisiana nor Arkansas record; in western Missouri it is common, and it passes eastward to about the middle of the State, the most eastern record being that of Mrs. Musick, at Mount Carmel, Mo., where both the first and the bulk arrived April 3, 1884; hence it is probable that the species will yet be found in northwestern Arkansas. In Iowa it ranges a little farther eastward, being common in western and middle Iowa, and a straggler has been taken at Mitchell, Iowa, near the Wisconsin line. It has even wandered twice to Illinois. The whole of Minnesota is included in its range, as there are records from the four corners of the State, and in the fall of 1883 it was taken at Trempealeau, Wis. The northern limit of its distribution is not yet known, but it extends far into British America. In the south it has not been found in southeastern Texas, though it is a common winter bird in southwestern Texas. Its range is thus seen to agree in general outline with that of the Lark Finch, were the latter moved two degrees to the west. The most western record that has come to notice is from Ellis, Kans.

This is one of the species that did not go into winter quarters in the winter of 1883–'84 until the cold weather of the first week in January. Previous to that it had been marked as abundant at Pierce City, Mo., and at Manhattan, Kans., but after January 2 none were seen at Pierce

City and not many at Manhattan. Its usual winter home is in southern Kansas, the whole of Indian Territory, and northern Texas. Mr. Lloyd states that it is a rare fall migrant in eastern Concho County, Tex. In the spring of 1884 the northward movement commenced about the 1st of March, and the bulk left Gainesville, Tex., March 12. Three days later the transients were at their height at Caddo, Ind. Ter. Those which spent the winter at Caddo left March 10. The bulk arrived at Pierce City, Mo., March 17, and the next day at Manhattan, Kans. At Alda, Nebr., they were seen March 23, and then for more than a month there was no advance. They appeared at Vermillion, Dak., May 3, and just two weeks later at Argusville, Dak. It had been previously recorded (May 10) by Miss Gertrude M. Lewis, at Frazee City, Minn. The bulk seldom moves more than four or five days behind the van. Some very late migrants were noted. One was seen at Gainesville, Tex., May 5, and at Manhattan, Kans., May 20. It is surprising that a species which migrates so late should not stop to breed on this side of the boundary line. It has never been found breeding in the United States, nor indeed anywhere, for the nest and eggs are unknown. Mr. Abbott saw a male at Turtle Creek, in central Dakota, in the latter part of July, 1881, but saw no signs of breeding, and though Prof. Aughey says he has often seen young in northeastern Nebraska, it is practically certain that it does not breed within that State. If it breeds anywhere in the United States it probably does so in northern Minnesota. Dr. Hatch says that specimens have come under his notice with ovulation so far advanced that he has no doubt they breed in the northeastern part of that State. A curious circumstance connected with its migration in the spring of 1884 was its entire absence from the vicinity of Ellis, Kans., where it is usually present both spring and fall, and sometimes in great abundance. Dr. Watson writes that in his study of migration at that point, extending over several years, nothing has struck him so forcibly as the great disparity in the numbers of the several species in different years, as if they visited Ellis merely from caprice; they are abundant one year, few or wanting the next, common in spring, scarce in the fall, and *vice versa.*

In the fall of 1884 the first Harris's Sparrow appeared at Des Moines, Iowa, October 18; the bulk arrived October 25 and departed on the same day, and none were seen there afterwards. The first came to Gainesville, Tex., November 5. A few remained all winter as far north as Manhattan, Kans. (latitude 39° 27′), and as far south as San Antonio, Tex. (latitude 29° 27′), these two parallels forming the limits of the winter range.

In migration in the spring of 1885 it was seen at Mount Carmel, Mo., April 28; Des Moines, Iowa, April 25; Lanesboro, Minn., May 10; Heron Lake, Minn., May 12; and Shell River, Manitoba, May 15. About forty were seen at White Earth, Minn., May 16, the first having arrived a day or two before. At Gainesville, Tex., the last was seen May 5; at Mount Carmel, Mo., May 3; Des Moines, Iowa, May 13; and Manhattan, Kans., May 23.

In the fall of 1885 migrants appeared at Elk River, Minn., September 21, where they remained but one week. They came to Lanesboro, Minn., September 27, and Iowa City, Iowa, October 17, and were not seen afterwards. They reached Emporia, Kans., October 6, and Gainesville, Tex., November 6. At the latter place they became common November 14.

554. Zonotrichia leucophrys (Forst.). [206.] *White-crowned Sparrow.*

Winters in the Gulf States and southward; migrates through the Mississippi Valley, and breeds in the Rocky Mountains and British America. In the spring of 1884 only fifteen observers sent reports concerning the movements of this species. From such limited data but little can be learned of its migrations. At San Angelo, Tex., it was reported as an abundant winter visitor. It remained abundant on April 8, and did not finally depart before May 19, when the last was seen. At Caddo, Ind. Ter., it appeared from the north November 9, was abundant until the weather became quite cold, and rare afterward; two were seen February 23, the last March 11.

At Saint Louis it was first seen February 24, and perhaps wintered. March 17 a party of four adults arrived; April 17 it was still very scarce, one party in a new place; April 18 a new party arrived, singing; April 29 the bulk arrived; April 30, height of the season; May 5, bulk continued, but numbers smaller than in preceding years; May 12, bulk departed; May 17, last. At Pierce City, Mo., they were abundant in fall migration; March 17 they were rare; April 16 the bulk departed; April 20 few were left. At Danville, Ill., the first arrival was noticed April 18; at Chicago, May 3; at Polo, Ill., the bulk came April 28. By May 7 it had appeared at West Depere, Wis.

Farther west, at Morning Sun, Iowa, it arrived April 5; at Red Wing, Minn., April 30; at Minneapolis, Minn., May 12. At Manhattan, Kans., about a dozen were seen April 26, and none afterward. At Vermillion, Dak., they arrived in numbers May 3, and by May 5 they reached Oak Point, Manitoba.

In the fall of 1884 the first White-crowned Sparrow appeared at Mount Carmel, Mo., October 9. It became common there the next day and left October 12. At San Angelo, Tex., the first was seen November 30, and at Gainesville, Tex., October 22. They were common all winter at San Antonio, Tex., and probably wintered near Emporia, Kans., since they were seen there February 14.

In the spring of 1885 the van of migration reached Saint Louis, Mo., April 22; Peoria, Ill., May 7; Hennepin, Ill., May 8; Lanesboro, Minn., May 10; and Heron Lake, Minn., May 16. They remained at San Antonio, Tex., until May 3. At Mason, Tex., they were seen for the last time May 4; at Gainesville, Tex., May 7; Pierce City, Mo., May 10; Saint Louis, Mo., May 15; and Mount Carmel, Mo., May 18.

In the fall of 1885 the last were seen at Lanesboro, Minn., October 7. They arrived at Saint Louis, Mo., October 6; increased there October 14; were numerous and musical October 26, and left November 11. At Emporia, Kans., the first were seen October 6.

555. Zonotrichia intermedia Ridgw. [207*a*.] *Intermediate Sparrow.*

Breeds in the far north, coming south in winter through the Western States to Mexico. During migration it is not uncommon as far east as the eastern edge of the plains. In middle and western Kansas it is common. Middle Kansas is not the extreme eastern limit of the range of the Intermediate White-crown. A single specimen was reported from Iowa years ago, and in 1871 Dr. Hoy took one near Racine, Wis. Several specimens have been taken, both in spring and fall, as far east as Minneapolis, Minn. (Bull. Nutt. Ornith. Club, Vol. IV, 1879, pp. 153, 154). It is a common winter resident in Tom Green County, Tex., and must frequently appear at points between Texas and western Kansas. It seems to prefer localities along the railroads where sunflowers and weeds have sprung up. Let all our observers be on the lookout for it. It is the more liable to be overlooked as it arrives after the other, and without close examination is naturally mistaken for it. In the fall of 1883 the first specimen was taken at Manhattan, Kans., by Prof. D. E. Lantz, October 9, at least a week after the ordinary White-crowns had passed southward. A few days later Col. N. S. Goss found them common at Wallace, Kans., much farther west. In the spring of 1884, at Manhattan, two of the same species were found, May 7. This was eleven days later than the migration of the White-crown. In the spring of 1885 several were seen at Manhattan, May 6.

557. Zonotrichia coronata (Pall.). [208.] *Golden-crowned Sparrow.*

A bird of the Pacific coast region, coming east in migration to the Rocky Mountains. A straggler was obtained at Racine, Wis., by Dr. Hoy.

558. Zonotrichia albicollis (Gm.). [209.] *White-throated Sparrow.*

Breeds in Manitoba and the northern part of the Mississippi Valley, and winters in the southern part. In the spring of 1884 twenty-nine observers sent reports concerning the movements of the well-known Peabody Bird. These reports seem to show that the species is far less abundant here than farther east. Gainesville, Tex., is the most southern point from which it was reported. Here a single bird was seen February 26. At Caddo, Ind. Ter., and a little farther east, it was common all winter, and February 23 it was as numerous as in November and January; March 15 a flock was seen; March 25 the last was seen. At Pierce City, Mo., the first was noted February 20, and the bulk departed April 16. At Saint Louis they were rare during the winter: a flock was seen December 28, but none were at the same place December 29. The first migrants arrived February 24, a few only; March 17 the numbers had doubled from six in a party to twelve; March 23 they had doubled from twelve to twenty-four, a few among them being in high plumage, and many in song. April 1 the same numbers were in the same places; the spring molt was progressing rapidly and the plumage was assuming higher colors. April 15 there was no change. April 17 birds in high dress arrived; April 18 they were noisy and conspicuous. By April 25 the highly colored birds had departed; flocks remained in plain dress and singing but little. The bulk continued until May 11, when great numbers of young, mostly plain females, arrived; song not often heard. May 12 the bulk departed; May 17 the last was seen.

The first movement northward, about February 24, did not extend far. Another began about March 10, when the first arrived at Fayette, Mo.; on the following day a stray one reached Chicago. March 15 the first arrived at Danville, Ill., and about this time the numbers increased at Saint Louis.

A third movement, though not as extensive, began March 27, when the first arrived at Polo, Ill. April 9 the first was seen at Newton, Iowa. Two days later, April 11, the first arrived at Red Wing, Minn. April 25 the first and only ones seen in spring migration were observed at Manhattan, Kans. April 28 they appeared at Elk River, Minn.; April 30 at Vermillion, Dak; and May 10 at Frazee City, Minn. At Green Bay, Wis., the bulk arrived May 4. At Coralville, Iowa, the bulk arrived April 29, and left May 7, and the last was seen May 15. At Waukon, Iowa, more than a hundred miles farther north, the last was seen May 17. At Lanesboro, Minn., the bulk arrived April 30; the height of the season was from April 30 to May 12; the bulk passed northward May 20; and the last one was seen May 25.

Thus the last great movement of this species began about April 25, and was at its height during the first week of May. The bulk reached Minneapolis, Minn., May 1; Elk River, Minn., and Vermillion, Dak., May 3; and Frazee City, Minn., May 12. At Argusville, Dak., none were seen in the spring of 1884.

The line of migration of this species seems to follow the two great rivers, the Mississippi and Missouri, and the timber belts along them. Observers in the prairie regions rarely see them.

In the fall of 1884 the first White throated Sparrow was seen at Elk River, Minn., September 22, and the bulk arrived September 27; the last was seen there October 5. At Mount Carmel, Mo., the first was seen September 27, and the last October 28. The first was seen at Gainesville, Tex., November 13. A party of four was found March 4, 1885, in the lowlands of Illinois, opposite Saint Louis, Mo., where they had probably wintered. Other individuals, which had possibly wintered in the vicinity, were seen at Saint Louis March 10 and March 25, and at Shawneetown, Ill., March 18.

In the spring of 1885 regular migration did not begin until the last two days of March. The first White throated Sparrow arrived at Paris, Ill., April 8, and at Emporia, Kans., April 18. The three days from April 20 to 22 were days of great movement, and the species was noted from Hennepin, Ill.; Mount Carmel, Mo.; Iowa City, Iowa; Waukon, Iowa; Lanesboro, Minn.; Chicago, Ill.; Leeds Centre, Wis.; and Elk River, Minn. By May 6 it had reached Shell River, Manitoba. None were seen at Pierce City, Mo., after May 9; Mount Carmel, Mo., after May 10; Saint Louis, Mo., May 22; Des Moines, Iowa, May 12; Coralville, Iowa, May 10; Grinnell, Iowa, May 10; Waukon, Iowa, May 14; Lake City, Minn., May 15; River Falls, Wis., May 19; and Lanesboro, Minn., May 25. At Saint Louis, Mo., the bulk of old birds arrived April 20; the height of the season was reached April 29; the bulk of old birds departed April 30, and the bulk of young birds May 12.

In the fall of 1885 the record of this species was more extended than that of any other. It appeared at Elk River, Minn., September 2; Lanesboro, Minn., September 18; River Falls, Wis., September 18; Grinnell, Iowa, September 28; Iowa City, Iowa, October 3; Des Moines, Iowa, October 3; Saint Louis, Mo., October 5; Emporia, Kans., October 7; Mount Carmel, Mo., October 8; and Gainesville, Tex., October 31. The last was reported from Elk River, Minn., October 8; River Falls, Wis., October 14; Lanesboro, Minn., October 18; Iowa City, Iowa, October 17; Des Moines. Iowa, October 26; Grinnell, Iowa, October 27; and Mount Carmel, Mo., November 4. The full fall record from Saint Louis is as follows:

> October 5, first; October 6, numbers in high dress, singing; October 10, bulk arrived; October 12, present in great numbers; October 17, height of the season, all patterns of color present, song continuously heard; October 20, those in high dress gone, numbers of plain birds present; October 27, great numbers in flocks; November 11, still numerous.

559. Spizella monticola (Gmel.). [210.] *Tree Sparrow.*

The Tree Sparrow breeds in the far north. In the Mississippi Valley it is one of the most abundant winter birds from latitude 43° south to latitude 34°. At Caddo, Ind. Ter., in the winter of 1883–'84, it outnumbered the Junco, or Slate-colored Snow-bird (*Junco hyemalis*), but in the heavy timber was less numerous than the White-throated Sparrow. The first was seen October 31, and it was abundant until February 26, when a large number departed; the remainder disappeared March 10. At Saint Louis it was the most abundant winter bird next to the Junco. It was not so numerous in January and February as in December; the flocks seemed to have thinned out, but kept their stands and began to sing and go up into the trees during the warm period of the first of February. About 50 per cent. left February 24, and the bulk followed March 17. Just before this they had been much excited, singing and mating. March 22, small flocks were still present, but quiet; the last was seen March 27. At Manhattan, Kans., it was an abundant winter visitor, arriving December 1 and remaining in numbers during the entire winter. March 8 about two hundred were seen; the height of migration was noted March 15 and the last a week later. It was abundant at Vermillion, Dak., where it began to sing March 24; all had left, apparently, April 30, but a single bird was seen May 3. During the winter it was found, though in smaller numbers, at Heron Lake and Lanesboro, Minn. February 23 and February 24 the first pronounced general movement was felt at Saint Louis and Lanesboro; but while it was a wave of departure at Saint Louis it was one of arrival at Lanesboro. This movement does not seem to have extended farther north than Lanesboro, and in many places probably the relative number of birds was left undisturbed. The first arrival at Waupaca, Wis., was noted March 24, at which time the species was exceedingly abundant at Iowa City and Lanesboro. By March 29 it had become abundant at Minneapolis and Elk River, Minn., where it arrived in large numbers on that and the preceding day. April 1 it arrived at West De Pere and Green Bay, Wis., and April 2 it reached Frazee City, Minn. It was noted at Portage la Prairie, Manitoba, April 15. At Milwaukee it did not appear in large numbers before April 26, ten days after the bulk had left Des Moines, Iowa. At West De Pere, Wis., it remained abundant until May 6.

In winter the center of abundance is along latitude 39°, south of which it reaches to latitude 34°, being found but rarely in the Gulf States east of Texas. Caddo, Ind. Ter. (lat. 34° 11′), is about as far south as the species winters in any numbers.

In the fall of 1884 the first Tree Sparrow appeared at Elk River, Minn., October 9; while the first was not reported from Hastings, Minn., until November 30. At Elk River the bulk arrived October 13 and left November 1. The first was reported from Des Moines, Iowa, November 15, and from Mount Carmel, Mo., November 13. The bulk arrived at Mount Carmel November 11. There can be no doubt about the cold-enduring powers of this bird. At White Earth, Minn. (lat. 47° 01′), on New Year's Day, 1885, a flock came around the house seemingly in excellent health and spirits, though the mercury indicated thirty-five degrees below zero. There was no other record of its wintering north of latitude 44°. Many were seen at Lanesboro, Minn., February 6.

In the spring of 1885 the bulk of migration took place in the ten days from March 30 to April 8, but the records were too irregular to admit of tracing the movements of the van. The first was seen at Elk River, Minn., April 2, and at Shell River, Manitoba, April 10. At Saint Louis, Mo., the last was seen April 2; at Grinnell, Iowa, April 5; Waukon, Iowa, April 9; Manhattan, Kans., April 12; New Richmond, Wis., April 18; Huron, Dak., April 18; Lanesboro, Minn., April 24; and Elk River, Minn., May 11. The Tree Sparrow is not known to breed south of our northern boundary. In the fall of 1885 the first returned to River Falls, Wis., October 17; Lanesboro, Minn., October 18; Grinnell, Iowa, October 27; Des Moines, Iowa, October 29; and Saint Louis, Mo., November 12.

559 a. Spizella monticola ochracea Brewst. [210, part.] *Western Tree Sparrow.*

The Western Tree Sparrow breeds in Alaska and migrates over western North America, coming as far east as Dakota, western Kansas, and middle Texas. It has been taken at Gainesville, Tex., by Mr. Ragsdale. In Concho and Tom Green Counties, Tex., it was common in small flocks in the winter of 1884–'85 (Lloyd).

560. Spizella socialis (Wils.). [211.] *Chipping Sparrow.*

Rare in western Manitoba, but a common summer resident in the Mississippi Valley. The winter home of this Sparrow is in the Southern States and Mexico, but Mexico receives the larger number. Mr. Ridgway queries its occurrence in Illinois in winter, and at Caddo, Ind. Ter., in the winter of 1883–'84, it was a very rare winter bird; less than half a dozen were observed during the entire cold season. On the northward journey it reached latitude 37° at Pierce City, Mo., March 19; the next day it was seen at Fayette, Mo., and two days later at Saint Louis. It seems probable that the normal advance, after being delayed by the snow-storms of the early part of April, reached latitude 42° about April 15; West De Pere, Wis., April 18; and Hastings and Elk Lake, Minn., on the 21st. It was also noted from Portage la Prairie, Manitoba. There were many irregular records. Considerable uncertainty attaches to the records of this species, because it is often confounded with the Tree Sparrow and the Field Sparrow. The bulk travels about two weeks in the rear of the advance guard.

In the fall of 1884 the bulk and the last left Des Moines, Iowa, October 9.

In the spring of 1885 about one-half of the records contributed on the migration of the Chipping Sparrow seem to be mistakes, and most of the rest are too irregular to be of much value. The following are probably correct: At Saint Louis, Mo., the first was seen March 30; at Shawneetown, Ill., April 1; Manhattan, Kans., April 4; Lanesboro, Minn., April 14; and Minneapolis, Minn., April 24. The whole record from Saint Louis is as follows: "March 30, first, silent, on ground; March 31, four males in song; April 1, still increasing; April 2, bulk of males present, and first females; April 5, bulk of females arrived; Chippies numerous and noisy; April 17, height of the season; April 23, Chippies in pairs."

In the fall of 1885 none were seen at River Falls, Wis., after October 6; nor at Iowa City, Iowa, after October 17. At Saint Louis, Mo., migration was in full progress October 7. The last flock was seen October 21, and the last individual October 31. The first arrived at Bonham, Tex., October 14, where they were common by October 19.

560 a. Spizella socialis arizonæ Coues. [211 *a.*] *Western Chipping Sparrow.*

This Western sparrow was first taken in Texas by Mr. N. C. Brown, who found it at Boerne. It comes as far east as Gainesville, Tex., where Mr. Ragsdale shot one April 24, 1884, which was molting. The last was seen there May 15. Mr. Lloyd states that this Sparrow is a resident of Tom Green County, Tex., where it is "tolerably common in winter; rare in summer." In the fall of 1884, at Gainesville, Mr. Ragsdale found the first November 3.

In the spring of 1885 the first returned to Gainesville May 12; but Mr. Lloyd, at San Angelo, had already (May 8) found a nest with four well incubated eggs.

561. Spizella pallida (Swains.). [212.] *Clay-colored Sparrow.*

Breeds from northern Nebraska, central Iowa, and northern Illinois northward, and is very abundant in western Manitoba. Its winter home seems to be south of central Texas, where Mr. Lloyd states that it is an abundant spring and fall migrant. Nehrling recorded it as abundant in winter in eastern Texas, near Houston, and Merrill as an abundant winter resident in the Lower Rio Grande Valley. In the spring it journeys north to British America and east to Missouri, Iowa, Illinois, and Wisconsin, being most abundant on the plains, and thence west to the Rocky Mountains. In western Kansas it is a common migrant. All the reliable records in 1884 came from the West, but they are so irregular as to preclude any timing of the migration. They show, however, either that the migration was very late, or that Dr. Coues put the time too early when he said, in his "Birds of the Northwest," that they arrive in northern Dakota the latter part of April. In the spring of 1884 the record was as follows: At Gainesville, Tex., the first and only one was seen May 13; at Ellis, Kans., it was abundant May 13; at Manhattan, Kans., the first was noted April 30, the height of the season May 14, the last May 15. At Alda, Nebr., the first was seen May 3; at Vermillion, Dak., the bulk arrived May 8; at Des Moines, Iowa, a male was shot May 10. At Minneapolis, Minn., one was shot May 12, and May 24 about one hundred and fifty were seen.

In the fall of 1884 the Clay-colored Sparrows reached Gainesville, Tex., November 3.

In the spring of 1885 a flock was seen at San Angelo, Tex., March 26; at Manhattan, Kans., May 4; Heron Lake, Minn., May 9; New Richmond, Wis., May 11; and more than a hundred and fifty were seen at White Earth, Minn., May 16. They reached Shell River, Manitoba, May 18. The record for 1885 thus bears out that of the previous year in determining that May, and not April, is the month for the arrival of this species in the Upper Mississippi Valley. At White Earth, Minn., they breed in great abundance. At San Angelo, Tex., the last was seen May 1; and at Manhattan, Kans., May 10. In the fall of 1885 the first returned to San Angelo, Tex., October 1.

562. Spizella breweri Cass. [213.] *Brewer's Sparrow.*

The Clay-colored Sparrow is represented in the western part of the United States by a near relative, Brewer's Sparrow. Mr. Brown took a single specimen at Boerne, Tex., March 5, 1880. Mr. Lloyd states that it is tolerably common in fall in Tom Green County, Tex., and winters abundantly in Pecos County. Mr. Ragsdale took a single specimen at Gainesville, Tex., during the spring of 1884.

563. Spizella pusilla (Wilson). [214.] *Field Sparrow.*

The Field Sparrow breeds from Indian Territory and southern Illinois northward nearly to the boundary, and occurs rarely in Manitoba. It has been taken in summer in central Mississippi, and may yet be found to breed far south. In eastern Kansas it is a common summer resident (Goss). It may be called one of the "half-hardy" Sparrows. It easily endures the winters as far north as southern Illinois, and is common from Illinois southward, but does not undertake to expose itself to the rigors of a real northern winter. In the winter of 1883-'84, at Caddo, Ind. Ter., it was one of the common winter residents, in company with Tree and White-throated Sparrows, and the first of the transients came February 20 to February 23. At Gainesville, Tex , it was marked as abundant February 26. In Concho County, Tex., it is tolerably common in fall and rare in winter (Lloyd); and in eastern Texas, near Houston, it is not uncommon in winter (Nehrling).

In the spring of 1884 a single male was seen at Saint Louis February 19, but no more for a month. Real migration seems to have begun about the middle of March, and March 17 it was seen at Saint Louis, Mo., and Griggsville, Ill. It was recorded from southern Iowa April 1, and reached the northern part April 5. The most northern record was from Lanesboro, Minn., April 14. On the plains the migration was later. Manhattan, Kans., and Vermillion, Dak., reported it April 21 and April 22, but Professor Lantz says it was not common at Manhattan until May 1.

In the fall of 1884 the bulk of Field Sparrows left Mount Carmel, Mo., October 7, and the last was seen October 22.

In the spring of 1885 a very early bird was seen at Saint Louis, Mo., March 2; the first came to Pierce City, Mo., March 8; and the second appeared at Saint Louis, March 10. At Manhattan, Kans., the first was seen March 26. The bulk came to Saint Louis, March 30 and March 31. April 4 and April 5 it was recorded from Mount Carmel, Mo.; Grinnell, Iowa; Newton, Iowa; Waukon, Iowa; and New Cassel, Wis. As in 1884, so in 1885, its most northern record was Lanesboro, Minn., where it was seen April 18. It has been known, however, to range in Wisconsin to latitude 44° 30′.

In the fall of 1885 the last at Grinnell, Iowa, was seen September 28; at Iowa City, Iowa, October 15; and at Mount Carmel, Mo., November 2. At Saint Louis, Mo., many were seen in flocks October 5; they had decreased October 20; the bulk left November 11, and the last was seen November 12. At Bonham, Tex., the first was seen October 16, and by October 19 they had become common.

563 a. Spizella arenacea (Chadbourne). [——] *Western Field Sparrow.*

This new Sparrow was described by Mr. Arthur P. Chadbourne from specimens collected at Laredo, Tex., during the fall and winter of 1885–'86 (The Auk, Vol. III, 1886, p. 248). More recently Mr. Lloyd has found it in winter in Tom Green and Concho Counties, Tex., where it is rare (*Ibid.*, Vol. IV, 1887, p. 292).

It occurs north, at least to northwestern Dakota, where it breeds.

565. Spizella atrigularis (Cab.). [215.] *Black-chinned Sparrow.*

A Mexican species, coming north to the valley of the Upper Rio Grande, in Texas.

566. Junco aikeni Ridgw. [216.] *White-winged Junco.*

This large Junco breeds in the Rocky Mountains, in Colorado, and Wyoming, and in the Black Hills of western Dakota. In winter it sometimes straggles east as far as middle Kansas and Indian Territory. In the winter of 1883–'84 it was found again by Dr. Watson at Ellis, Kans., so that it may be considered a regular visitant to the plains in Kansas.

567. Junco hyemalis (Linn.). [217.] *Junco; Slate-colored Snowbird.*

Breeds from northern Minnesota northward, and winters throughout the middle belt of the Mississippi Valley. A most abundant and well-known bird, concerning which so many records were received that its movements can be traced with some degree of accuracy. In the spring of 1884 but four notes of its wintering were received from the region north of latitude 41°. They are as follows: From Morning Sun, Iowa, "seen last winter;" from Coralville, Iowa, "was here last winter;" from Waukon, Iowa, "arrived October 15, a few remained all winter;" and from Heron Lake, Minn., "a very few were seen all winter." In fact, it was not common at any place north of latitude 41°, and was not abundant north of latitude 40°. This must be accounted for by the unusual severity of the winter, as the ordinary winter limit of the species is from latitude 42° to latitude 43°, and one hardy individual has been known to pass the winter in northern Minnesota at latitude 47°. Latitude 39° is just within the true winter home of the Junco. The great bulk of the species in the winter of 1883–'84 remained between latitude 39° and latitude 36°, being in that section the most numerous winter resident. They were hardly noticed by any of the Southern observers. At Caddo, Ind. Ter., they were most conspicuous by their absence; not a dozen a day were seen in town, and less than thirty in the timber.

Of their spring movements there were but few irregular notes, from which it may be inferred that the migration was quite regular and that the species is an easily noticed bird. The record from Iowa and Minnesota is as follows: March 14 the first one was seen at Ferry, Iowa; March 16 at Laporte City, Iowa; March 22 at Mitchell, Iowa; March 24 at Lanesboro, Pine Bend, and Elk River, Minn. At Minneapolis the first was noted March 27, but as the arrival of the bulk was recorded the next day, it is evident that the first came some days sooner, probably March 24. East of the Mississippi, arrivals were noted March 24 at Lake Mills, Wis., and at West De Pere, Wis., so that this must have been a great day for the migration of Juncos as it was for many other species. Additional records from the region east of the Mississippi show that it reached Chicago March 20 and Milwaukee March 22. In Dakota, arrivals were reported at Argusville and Larimore March 27; and at Two Rivers, Manitoba, April 15.

The bulk was not very far behind the van, traversing Iowa about March 25, and arriving in Minnesota up to latitude 45° on the 27th and 28th, while April 20 the main flocks reached Portage la Prairie, Manitoba, latitude 50°. In northeastern Iowa and southeastern Minnesota, they were most numerous April 10. On the same day they were marked "innumerable" at Waukon, and at Lanesboro "numerous beyond all reckoning." The record of the departure of the bulk was more regular and extended than that of its arrival. It is as follows: Texas, latitude 33° 36′, March 13; Indian Territory, latitude 34° 11′, March 10; Indian Territory, latitude 35° 37′, March 20; Missouri, latitude 38° 40′, March 27; Missouri, latitude 38° 45′, March 31; Kansas, latitude 39° 12′, April 1; Iowa, latitude 42° 18′, April 10; Iowa, latitude 43° 15′, April 17; Dakota, latitude 42° 56′, April 21; Minnesota, latitude 43° 43′, April 2[illegible]; Minnesota, latitude 43° 48′, April 20; Minnesota, latitude 45° 25′, April 28. The records from latitude 42° 56′, in Dakota, and 43° 48′, in Minnesota, were a little later than the others from the same latitude because these stations are farther west. All the irregular notes were made April 16, and came from latitude 36° 56′, in Missouri, and latitude 41° 36′ and 42° 01′, in Iowa. The records of the "last one seen" are also quite regular, and will be given in full. The last Junco seen at latitude 33° 36′, in Texas, was April 23; at latitude 38° 40′ and 38° 45′, in Missouri, April 24; at latitude 39° 19′, in Illinois, April 23; at latitude 40° 50′, in Iowa, April 25; latitude 41° 51′, in Illinois, April 30; latitude 42° 18′, in Iowa, April 24; latitude 43° 15′, in Iowa, April 30; latitude 43° 43′, in Minnesota, April 30; latitude 44° 32′, in Minnesota, May 1; latitude 44° 45′, in Wisconsin, May 4. The irregular dates of departure are: Latitude 34° 11′, in Indian Territory, March 26; latitude 39° 12′, in Kansas, April 13; latitude 42° 56′, in Dakota, May 3; and latitude 42° 16′, in Illinois, April 12. The total number of notes sent in on this species was ninety-eight. The average time given from the arrival of the first to the arrival of the bulk was seven days, and from the departure of the bulk to the date of the last one seen, seventeen days. Mr. J. A. Balmer sent the following notes from Danville, Ill. (latitude 40° 08′):

> Many large flocks wintered here, but the bulk left by the 1st of May. On June 1 I noticed a male bird; June 7, both male and female; and again, on June 21, I saw a male bird, always near the same spot. This led me to think the pair might be nesting here. I have searched pretty thoroughly for their nest, but without success.

In the fall of 1884 the first Junco appeared at Elk River, Minn., September 24, and the bulk arrived October 1. The bulk departed November 1, and the last four days later. None were reported from Hastings, Minn., until November 25. At Des Moines, Iowa, the first was reported October 18, the bulk arriving October 22. At Mount Carmel, Mo., the first appeared October 13, and the bulk arrived November 1. The first came to Gainesville, Tex., October 22. Mr. Lloyd states that it is common in winter in Tom Green and Concho Counties, Tex., and Mr. Nehrling recorded it as an abundant winter resident in southeastern Texas.

In the spring of 1885, instead of ninety-eight notes (the number contributed in 1884) but thirty-six were received. The most northern stations which recorded Juncos during the winter of 1884–85, were Leeds Centre, Wis., and Lanesboro, Minn. They appeared at Laporte City, Iowa, and Waukon, Iowa, the middle of March. The last four days of March and the first three days of April they were reported from Chicago, Ill.; Clinton, Wis.; Milwaukee, Wis.; Durand, Wis.; New Richmond, Wis.; Hastings, Minn.; Minneapolis, Minn.; Elk River, Minn.; Argusville, Dak.; and Oak Point, Manitoba. An immense movement must have occurred during these seven days. Other stations in Manitoba recorded their arrival April 7 and April 8. The whole record from Saint Louis is as follows: "During the coldest weather our Slate-colored Snowbirds scatter over the farm-yards, but as soon as the weather moderates they flock together and then their numbers can be judged. It was difficult to say whether or not the total number was much smaller than usual in the winter of 1884–'85. At several stands not 50 per cent. were to be found during the last days of February, while at others they seemed as numerous as ever. April 1, there were great numbers present, excited old birds singing and chasing one another; April 2, a decrease; April 6, bulk departed; April 7, several small flocks present, very light-colored birds; April 17, small flocks; April 19, last." From other stations the records of "lasts" were somewhat irregular. At Pierce City, Mo., the last was seen May 3 (the position of this station, near the Ozark Mountains, probably explains the lateness of the date of departure); at Mount Carmel, Mo., the last one was seen April 11; Manhattan, Kans., April 5; Chicago, Ill., April 21; Des Moines, Iowa, April 21; Waukon, Iowa, April 24; Leeds Centre, Wis., April 21; Durand, Wis., April 23; New Richmond, Wis., April 29; Lanesboro, Minn., April 30; Lake City, Minn., April 27; and Elk River, Minn., May 6.

In the fall of 1885 the arrival of the first at Elk River, Minn., was recorded September 23; New Richmond, Wis., September 25; Lanesboro, Minn., September 27; Milwaukee, Wis., October 3; Grinnell, Iowa, October 4; Iowa City, Iowa, October 3; Des Moines, Iowa, October 3; Saint Louis, Mo., October 10; Mount Carmel, Mo., October 16; and Bonham, Tex., October 30. At Gainesville, Tex., they were seen for the second time November 7; a straggler had previously been seen early in October. At Elk River, Minn., and Milwaukee, Wis., none were seen after November 12. The bulk arrived at Saint Louis, Mo., October 21, and were still numerous there November 11.

567 a. Junco hyemalis oregonus (Towns.). [218.] *Oregon Junco.*

All the notes on this species came from the West. The regular home of this Junco is northwest of our district, but in migration a few come east far enough to encounter our observers. It occurs in western Manitoba, and from Kansas southward it is a winter resident. It was found at San Angelo, Tex., in company with the White-crowned Sparrow. At Gainesville, Tex., in 1884, it was seen March 5, but left soon after. At Caddo, Ind. Ter., it came January 1, and remained through February; while at Manhattan, Kans., it came October 27, 1883, with *Junco hyemalis*, and remained a few days later than that species, the latter leaving April 22.

The Oregon Junco was common at Manhattan, Kans., throughout the winter of 1884-'85, and the last departed March 14, 1885. It has been found accidentally at Chicago and in Michigan.

569. Junco caniceps (Woodh.). [220.] *Gray-headed Junco.*

The home of this Junco is in the Rocky Mountain region. It has been recorded from Texas (Woodhouse); the Black Hills (Coues); and Michigan (Atkins).

570 a. Junco cinereus dorsalis Henry. [221.] *Red-backed Junco.*

Mr. Lloyd has brought this southwestern Junco within our district by finding it a winter resident at Fort Davis, Tex., at an altitude of nearly 5,000 feet.

573. Amphispiza bilineata (Cass.). [224.] *Black-throated Sparrow.*

An inhabitant of the Southwestern States and northern Mexico, reaching its eastern limit in the valley of the Lower Rio Grande, in Texas, where it is common (Merrill; Sennett). It was found as a rare winter resident at Mason, Tex., and as a common resident at San Angelo, Tex., where four nests were found during the last week of May in the skirts of dense chaparral along the edges of ravines. The finding of a nest with fresh eggs July 13 indicates that the bird raises two broods. Mr. Lloyd states that "this species has extended east within the last six years to the Colorado River."

574 a. Amphispiza belli nevadensis (Ridgw.). [225*a*.] *Sage Sparrow.*

Another Western Sparrow. On the eastern slopes of the mountains in western Texas, at an elevation of about 5,000 feet, is the Government post, Fort Davis. Here are found the Red-naped Woodpecker, the Common Phœbe, the Townsend's Solitaire, the Swamp Sparrow, the Arizona Stephens Vireo, and Marsh Wrens, which agree exactly with the Pacific coast form; and here, during the winter of 1885-'86, Mr. Lloyd found the Sage Sparrow.

575a. Peucæa æstivalis bachmanii (Aud.). [226a.] *Bachman's Sparrow.*

Bachman's Sparrow is a bird of the Southeastern States, reaching its western limit in Texas. Although it is rather a common species along the southern course of the Mississippi, up to southern Indiana and southern Illinois, it was noted by but few of the observers. It was found at Pierce City, Mo., as a not common breeder; and at Gainesville, Tex., as a very rare species. At Gainesville, in 1876, the first came April 10; but in 1884 the first was not noted, and only two specimens were shot. Mr. Lloyd gives it as a breeder in eastern Concho County, Tex.

577. Peucæa mexicana (Lawr.). [——] *Mexican Sparrow.*

Breeds in the valley of the Lower Rio Grande, in Texas, and thence southward and westward. Dr. J. C. Merrill, U. S. Army, found it "in some abundance on a salt prairie about 9 miles from Fort Brown, Tex.," where he took a nest containing four fresh eggs, June 16, 1877.*

578. Peucæa cassini (Woodh.). [228.] *Cassin's Sparrow.*

In our district this species ranges as a summer resident from southeastern Texas to middle and western Kansas. In eastern Texas, near Houston, Mr. Nehrling recorded it as "a common summer resident on the open grassy prairies." Along the Lower Rio Grande, in the extreme southeastern corner of the State, both Dr. Merrill and Mr. Sennett found it breeding. Mr. Lloyd states that it is a common summer resident in Tom Green County, Tex., and is tolerably common in Concho County in fall. It was observed at Gainesville, Tex., where the first arrived May 13, and where it was marked rare.

In the spring of 1885 the first Cassin's Sparrow arrived at San Antonio, Tex., May 11.

580a. Peucæa ruficeps boucardi (Scl.). [230.] *Boucard's Sparrow.*

Occurs from central western Texas westward and southward. Mr. Ridgway has kindly shown me a specimen, in the collection of the U. S. National Museum, which was killed about the middle of May, 1878, at Colorado, Mitchell County, Tex., where it was doubtless breeding.

580b. Peucæa ruficeps eremœca Brown. [——.] *Rock Sparrow.*

Mr. Nathan Clifford Brown described this subspecies from specimens taken by him at Boerne, Tex., in the winter of 1879–'80 (Bull. Nutt. Ornith. Club, Vol. VII, 1882, pp. 38, 39). A male and female had been previously killed in Gillespie County, Tex. (April 24, 1878), by Mr. Ragsdale. They were regarded as *P. ruficeps* (*Ibid.*, Vol. III, 1878, pp. 188, 189).

581. Melospiza fasciata (Gmel.). [231.] *Song Sparrow.*

The Song Sparrow breeds in Manitoba and throughout most of the northern half of the Mississippi Valley, and was reported as a winter

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*Proc. U. S. Nat. Mus., Vol. I, 1878, p. 127. It was recorded under the name of *Peucæa arizonæ*, which Mr. Ridgway now regards as not separable from *P. mexicana*. (Manual of North American Birds, 1887, p. 594.)

resident from various points in Illinois, Missouri, eastern Kansas, Indian Territory, and Texas.

Many observers are so situated that their field-work does not take them into favorable localities for this species. Its favorite haunts in winter are the dense weeds and grass along our streams; hence it is not strange that it is so often overlooked. Our reports, therefore, are so incomplete that it is impossible to fix the bounds of its winter residence, or the extent of its breeding range. Only twenty-five observers recorded its movements in 1884.

At Caddo, Ind. Ter., it was first seen November 6, 1883. Many must have wintered south of that point, for the bulk was reported as arriving March 11, 1884. The last lingered until April 4. At Pierce City, Mo., after January 2, only single birds were seen. The bulk arrived from the south March 29. At Saint Louis, Mo., Mr. Widmann reported seeing one December 29, at Florisant. February 15 the same small numbers as last year were at old stands. March 13 an increase was observed and the first song was heard. March 17 the bulk arrived, and small parties of highly-colored birds in full song were conspicuous. Ten days later, March 27, the bulk departed. A single bird in company with *M. georgiana* was seen April 14, and again April 17.

At Manhattan, Kans., the species is a rather common winter resident; it arrived from the north October 13; was seen at intervals during the entire winter in favorable localities; the bulk arrived March 15, and the last was seen April 5. Manhattan is almost directly north of Caddo, and 350 miles distant. The bulk reached Manhattan from the south four days later than it was noted at Caddo, while in the fall migration the first was seen at the former station twenty-three days earlier than at the latter.

Apparently the bulk of Song Sparrows moves from winter quarters all at once. This movement began about March 10, reaching Caddo the following day. March 13 there was an increase at Saint Louis, and by March 15 the bulk reached Manhattan. At Saint Louis the bulk arrived by March 17. March 19 the wave of migration reached Polo, Ill., and Milwaukee, Wis. March 20 the first arrived at New Cassel, Wis. March 24 it reached Lake Mills, West De Pere, and Green Bay, Wis. The bulk seemed to arrive simultaneously with the first, or but a few hours later.

March 28 the first reached Elk River, Minn., but it was not seen at Minneapolis until April 5, when it was also seen at Hastings, Minn. On the plains, out of the line of the river woodlands, it seemed to travel more slowly.

The bulk arrived at Minneapolis April 11. On the same day the first reached Oak Point, Manitoba. April 12 the first reached Larimore, Dak. At this time the last had not departed from Saint Louis.

Of the breeding habits of this species, or of the localities in which it breeds, little was reported. It was noted as breeding at Newton, Iowa, where it arrived April 9. Perhaps the most surprising note received was that from Dr. Watson, at Ellis, Kans., who reported it as a common summer resident. It does not remain to breed at Manhattan, which is much farther east. Col. N. S. Goss enters it on his "Catalogue of Kansas Birds" as "resident in eastern Kansas; rare in summer; common during the winter in thickets and sheltered lowlands."

In the fall of 1884 the bulk of Song Sparrows left Elk River, Minn., October 8, and the last November 11. At Mount Carmel, Mo., they were first seen October 22.

The most northern record of its wintering during the cold season of 1884-'85 came from Manhattan, Kans., where a few remained.

In migration in the spring of 1885 it arrived at Saint Louis, Mo., March 5, the bulk following March 14. The first came to Fernwood, Ill., March 27, and the next day to Chicago, Ill. By April 1 they had appeared at Stoughton, Wis.; Milwaukee, Wis.; Lake Mills, Wis.; Leeds Centre, Wis.; and Waukon, Iowa. April 3 and 4 they were reported from Lanesboro, Minn.; Minneapolis, Minn.; Green Bay, Wis.; and Luck, Wis. They reached Elk River, Minn., April 8, and Oak Point, Manitoba, April 13. The bulk left Saint Louis, Mo., April 6, and the last was seen there April 12. "Lasts" were reported from Pierce City, Mo., April 1; Houma, La., April 20; Mount Carmel, Mo., May 8; Manhattan, Kans., March 25; and Des Moines, Iowa, May 2. At Fernwood, Ill., a nest with five eggs was taken June 1.

In the fall of 1885 the first returned to Saint Louis, Mo., October 6; Mount Carmel, Mo., October 8; and to Bonham, Tex., October 17. At Elk River, Minn., the last was seen October 16; at Lanesboro, Minn., November 8; and at Grinnell, Iowa, November 24. At Saint Louis they were numerous October 26, in great numbers in flocks October 27, and the bulk left October 11.

581 b. Melospiza fasciata montana Hensh. [231 *a*, part.] *Mountain Song Sparrow.*

The known habitat of this Western race is in Colorado, Utah, Nevada, and northward. Some Song Sparrows taken during the fall of 1885, by Mr. Lloyd, at Fort Davis, Tex., have been identified by Mr. Ridgway as this subspecies.

583. Melospiza lincolni (Aud.). [234.] *Lincoln's Sparrow.*

Breeds but sparingly in the United States. For a long time Racine, Wis., was the southernmost point at which it was known to nest; but recently nests have been found in northern Illinois.

From southern Illinois southward Lincoln's Sparrow may be found in winter; but the great bulk of the species winters south of latitude 36°. In Kansas it is a common migrant. In eastern Texas it is common in winter (Nehrling), as it is in the valley of the Lower Rio Grande (Merrill). At Caddo, Ind. Ter., a few were found during cold weather, and probably they were more common than they seemed; since, owing to their shyness, they are not easily observed. The advance movement at Caddo in 1884 began the second week in March, and by March 15 they were in force. April 4 they were still present in about one-third of their highest numbers. Latitude 39° 12′, in Kansas, was reached April 24; latitude 38° 40′, in Missouri, April 29; latitude 41° 36′, in Iowa, and 41° 51′, in Illinois, May 9; and West De Pere, Wis. (lat. 44° 26′), May 17. The last one left Gainesville, Tex. (lat. 33° 36′), May 14, and Saint Louis (lat. 38° 40′) May 20.

In the fall of 1884 the bulk of migrants reached Des Moines, Iowa, October 25. They left there the same day, and none were seen afterward. The first reached Gainesville, Tex., October 27.

But few records were received of its movements in the spring of 1885. The first was seen at Gainesville, Tex., March 29; at Bonham, Tex., April 3; Manhattan, Kans., April 18; Saint Louis, Mo., April 22; Des Moines, Iowa, April 25; Newton, Iowa, April 24. The last was noted at Manhattan, Kans., April 29; Saint Louis, Mo., May 13; and Des Moines, Iowa, May 12. One was seen at Bonham, Tex., as late as May 20.

In the fall of 1885 they returned to Lanesboro, Minn., September 18, where many were present October 2; and they left October 6.

At Des Moines, Iowa, the last was seen October 10. The first came to Saint Louis, Mo., October 7; the bulk arrived there October 11, and the last was seen October 27. The bulk appeared at Gainesville, Tex., October 31.

584. Melospiza georgiana (Lath.). [233.] *Swamp Sparrow.*

This Sparrow is found throughout Manitoba and the whole of the Mississippi Valley. It breeds from northern Illinois far into British America, and winters from Kansas and southern Illinois southward. It is common near the Mississippi River, but rather rare on the Western plains. The most western records received from our observers were from San Angelo, Tex., where it was common in the spring of 1884, and at Ellis, Kans., where it was a rare transient. Mr. Nehrling gave it as a rare winter resident at Pierce City, Mo., but says it is more abundant in the valleys a little distance away. A single bird or two are usually found during the winter at Saint Louis, but none were seen there in 1884 until February 19. In the latter part of March the numbers at Saint Louis began to increase, but no migratory advance was made by the Swamp Sparrow until April 1. On April 3 many came to Burlington, Iowa, and the species reached the center of the State about the middle of the month. April 26 and April 27 it was reported from Waukon, Iowa, and Lanesboro, Minn. The most northern record was from Oak Point, Manitoba. Here the first was noted April 24, but, though the species goes as far north as this, there must be some mistake about the date, for the ice did not leave the lakes till five weeks afterward. The bulk arrived at Lanesboro, Minn., April 27; and the same day it left Saint Louis, where the last was seen May 10.

In the fall of 1884 the first Swamp Sparrow arrived at Elk River, Minn., September 7, and the bulk five days later. The bulk did not leave until October 3, and the last was seen October 12. At Mount Carmel, Mo., the first and last were reported together October 7.

In the spring of 1885 the first came to Saint Louis, Mo., March 14; Fayette, Mo., March 16; Newton, Iowa, March 28; and Heron Lake, Minn., March 29. All of these records are those of a very few birds that scattered over Missouri and Iowa in March. The bulk of the species did not follow for nearly a month. April 17 was the height of the season at Saint Louis, and the bulk left there April 20. On this same day they became common at Newton, Iowa; Waukon, Iowa; Lanesboro, Minn.; and the first arrived at Elk River, Minn. None were seen at Mount Carmel, Mo., after May 2, but as late as May 14 one was seen at Saint Louis, Mo.

In the fall of 1885 the first was seen at Mount Carmel, Mo., September 27, but no more were seen until October 6. At Saint Louis, Mo., they appeared October 5, and at Emporia, Kans., October 2. "Lasts" were reported from Elk River, Minn., October 15; Lanesboro, Minn., October 7; and from Des Moines, Iowa, October 29, at which date about fifty were seen. Great numbers were present at Saint Louis, October 27, and the bulk departed November 11.

585. **Passerella iliaca** (Merrem.). [235.] *Fox Sparrow.*

Breeds north of our northern boundary and winters in the Southern States, usually as far north as eastern Kansas. Few birds migrate more rapidly than the Fox Sparrow, and it is not uncommon for the first, the bulk, and the last to be noted during the same week. In the spring of 1884 migration was much more prolonged than usual. The cold wave of January 1 sent the species into more than ordinarily southern winter quarters. At Manhattan, Kans., it is usually a common winter resident. In the winter of 1883–'84 it was abundant until New Year's, but disappeared then until March. Only one bird was seen at Saint Louis during the winter; and at Pierce City, Mo., though many had remained the winter before, none were seen after December. South of latitude 37° it was an abundant winter resident. The first slight movement took place in the latter part of February, bringing a few more individuals to Caddo, Ind. Ter., the bulk to Saint Louis, and the first to Carlinville, Ill., but no real migration occurred until about the middle of March. Leaving out of account irregular notes, the regular movements appear to have been as follows: March 15 the species arrived at Manhattan, Kans., and Danville, Ill.; March 16 at Osceola, Ill.; and March 19 at Iowa City, Iowa. Then no movement was reported until March 27 and March 28, when it appeared over the rest of Iowa and over Minnesota up to Elk River. In Wisconsin it appeared along the forty-fifth parallel about April 1, and at Portage la Prairie, Manitoba, April 22. The bulk came to Gainesville, Tex., Caddo, Ind. Ter., and Pierce City, Mo., March 17; Mount Carmel, Mo., March 19; Iowa City, Iowa, March 20; and Lanesboro, Minn., March

29. The bulk left Mount Carmel and Saint Louis, Mo., March 26, and Lanesboro, Minn., April 21. The last left Gainesville, Tex., and Caddo, Ind. Ter., about April 1. From Manhattan, Kans., and Saint Louis, Mo., they departed April 4 and 6, though at Saint Louis a stray one was seen April 17 in company with Hermit Thrushes. At Des Moines and Waukon, Iowa, the last was marked April 20; at Milwaukee, Wis., the day before; at Lanesboro, Minn., April 26, and at Elk River, April 28.

In the fall of 1884 the first and last Fox Sparrow was seen at Elk River, Minn., October 6. The first came to Des Moines, Iowa, October 9, the bulk October 25, and the last was seen there October 27. At Mount Carmel, Mo., the first was seen November 3, and the last November 8.

During the winter of 1884–'85 no Fox Sparrows remained at either Manhattan, Kans., or Saint Louis, Mo.

In the spring of 1885 one flock was found in the lowlands of Illinois, opposite Saint Louis, March 5. March 14 the first was seen on the Missouri side of the river, and the same day the first one returned to Manhattan. At Fayette, Mo., about twenty were seen March 15; and a pair were observed March 24 at Paris, Ill. During the first six days of April they were noted from Des Moines, Iowa; Coralville, Iowa; Grinnell, Iowa; Newton, Iowa; Waukon, Iowa; Hennepin, Ill.; Rockford, Ill.; Leeds Centre, Wis.; Durand, Wis.; Lanesboro, Minn.; and Elk River, Minn.

The records of "lasts" were irregular, and ranged between April 12 for Saint Louis and Mount Carmel, and April 23 for Durand and Elk River.

The fall notes on the Fox Sparrow, in 1885, were more irregular than those relating to any other species. Fox Sparrows were noted at about the same time (the first week in October) at various stations from latitude 45° 25′, in Minnesota, to Central Missouri. At Elk River, Minn., the last was seen October 18, and at Grinnell, Iowa, October 27, at which latter date they were very numerous in flocks at Saint Louis. The bulk left Saint Louis November 11. The last was seen at Mount Carmel November 14, and the first reached Gainesville, Tex., November 15. Mr. Ernest E. Thompson has recorded this species as breeding abundantly at Duck Mountain, Manitoba.

585 c. Passerella iliaca schistacea (Baird). [235 *c.*] *Slate-colored Sparrow.*

The Rocky Mountain representative of the foregoing. In migration it comes east to the plains, and has been taken in Kansas.

586. Embernagra rufivirgata Lawr. [236.] *Texas Sparrow.*

The home of this Sparrow is in the Lower Rio Grande Valley, in Texas, where it is common (Merrill and Sennett).

587. Pipilo erythrophthalmus (Linn.). [237.] *Chewink; Towhee.*

Breeds in the middle and northern portions of the Mississippi Valley and Manitoba; winters in the Southern States; a few breed in southeastern Texas (Nehrling). In eastern Kansas it is a common resident.

Reports upon its movements in 1884 were received from but forty observers. None of these came from the region of the Lower Mississippi. Indeed, but three of them were from stations south of the thirty-seventh parallel; the result is that little has been added to our knowledge of the winter habits of this well-known bird.

In Texas the Chewink seems to range farther west than in Kansas and Nebraska. At San Angelo, Tex., it was seen several times during the winter, and two were shot in January, 1884. At Gainesville, Tex., it was a common winter resident, remaining until April 24, when the last was heard. At Caddo, Ind. Ter., it was abundant as early as November 29, 1883, and most of the birds were in pairs. On March 8 they began to spread out from winter quarters. In southern Kansas and Missouri they frequently remained during the winter. At Pierce City, Mo., none were seen in 1884 later than the last of December, although the preceding winter they were abundant. At Saint Louis, Mr. Widmann reported two pairs as remaining all winter in company with Cardinals. At Manhattan, Kans., none were seen later in the fall than the latter part of November; but the preceding year they remained until the extreme cold of the middle of January drove them out. In 1884 the first arrival in migration was reported at Saint Louis, February 24; but the movement did not appear to be general. The arrivals consisted of a few males and females. March 11 a stray migrant appeared at Chicago, Ill., and on the following day the regular advance came to Hillsboro and Carlinville, in the same State. March 15 they were reported at Danville, Ill., and Manhattan, Kans.; March 22 at Burlington, Iowa; March 23 at Iowa City, Iowa; March 27 and March 28 at Laporte City, Iowa, at Polo, Ill., and Des Moines, Iowa. Along Lake Michigan they seem to have been a little earlier, arriving at New Cassel and Milwaukee March 24 and March 26. In this species, migration along the Mississippi River seems to have been more retarded than along the eastern border of the district or along the border of the plains in Kansas, which is contrary to the rule among most species. How far the food supply and the condition of the weather influenced these movements can only be determined by the most careful observation. April 4 the first was seen at Lake Mills, Wis.; April 10 at Waukon, Iowa; April 18 at Lanesboro, Minn.; April 24 at Lake City, Minn.; April 26 at Waupaca, Wis.; April 27 at Green Bay, Wis.; April 30 at Elk River, Minn.; and May 17 at Frazee City, Minn. At Manhattan, Kans., the bulk arrived March 19; at Hillsboro, Ill., April 8; at Polo, Ill., April 15; at Iowa City, Iowa, April 19; at Lake Mills, Wis., April 28; at Milwaukee May 3; at West De Pere, Wis., May 16; at Frazee City, Minn., May 20; at Vermillion, Dak., May 8; at the latter place the species was most abundant June 12.

From Mr. Widmann, at Saint Louis, the following full report was received:

February 24, first arrival; March 13, first song-birds still scarce; March 17, arrival of bulk; March 23, many, noisy, conspicuous; March 31, transients in parties of six to eight; April 1, summer residents carrying building material; April 4, last transient; April 17 to 19, singing, fighting, love making; May 24, first young out of nest.

At Manhattan, Kans., two broods are reared in a season; the first young are hatched early in May; the nests are almost invariably built upon the ground; the second brood is hatched in June, and the nests are almost uniformly built in bushes from 2 to 7 feet from the ground.

In the fall of 1884 the last Chewink was seen at Des Moines, Iowa, August 29; the bulk left Mount Carmel, Mo., October 20, and the last October 27; at San Angelo, Tex., the first came September 29, and by October 9 they were common.

In the spring of 1885 there was almost a double set of notes for this species. The second record, in at least half the cases, was a week or more later than the first, instead of a day or two later, as is the rule with most birds. At Saint Louis, Mo., the first came March 10, and the bulk of males on the 14th; and on this latter date the first one was seen at Shawneetown, Ill. Two days before this the second was seen at Odin, Ill., the first having come long before. The first reached Paris, Ill., March 27, the day before it was noted at Manhattan, Kans. Then there was a double movement. The first wave (from April 1 to April 6) brought large numbers of Chewinks to southern Iowa, and a sprinkling to various points in northern Illinois. The second occurred after an interval of two weeks, and brought a second set of "firsts" to Iowa and Illinois on April 20, April 21, and April 22, and passed on to latitude 45°, in Wisconsin and Minnesota. After another pause, Elk River, Minn., was reached May 6; Menoken, Dak., May 12; White Earth, Minn., May 16 (many were seen), and Oak Point, Manitoba, May 18. The last left Bonham, Tex., April 14, and Gainesville, Tex., May 12.

In the fall of 1885 the last Chewink was reported from Elk River, Minn., September 29; from Lanesboro, Minn., November 8; Grinnell, Iowa, October 17; Iowa City, Iowa, October 17; and Des Moines, Iowa, October 7. At Saint Louis, Mo., Chewinks were common in large flocks September 23; the bulk arrived October 5; they were most numerous from October 6 to October 12; the bulk departed October 20, and the last transient was seen November 11. At Mount Carmel, Mo., the last was seen December 16. The first migrant reached Bonham, Tex., November 11, and they became common November 16.

588. Pipilo maculatus arcticus (Swains.). [238.] *Arctic Towhee.*

In our district this Towhee occurs in Texas, Indian Territory, Kansas, Nebraska, and Dakota. In winter it is found from western Kansas southward. Mr. Lloyd states that it is a tolerably common winter resident in Tom Green and Concho Counties, Tex. At Ellis, Kans., in 1884, the first was seen April 27. At Manhattan it was probably heard March 15; the first was seen March 19; the bulk came April 26; the species was still abundant May 3; the bulk left May 10; and the last was seen May 12.

In the spring of 1885 the first Arctic Towhee was seen at Manhattan, Kans., February 25; the second March 7, and was common April 26.

In migration, at Manhattan, Kans., the Arctic Towhee is much more abundant than the eastern species. In the autumn they linger until late in the winter, sometimes remaining with *erythrophthalmus* during the entire winter. In the spring they arrive in large numbers after *erythrophthalmus*, and remain about two weeks.

590. **Pipilo chlorurus** (Towns.). [239.] *Green-tailed Towhee.*

The home of this species is in the interior plateau region of the United States, from the western border of the plains to the Sierra Nevada, from about latitude 40° south into Mexico. Several years ago it was taken in southwestern Texas, and February 25, 1885, Mr. Harry Attwater took a specimen at San Antonio, Tex. Mr. Lloyd has recently published the following in regard to its occurrence in Texas:

> The bird must be spreading east, as I see it as far east as the head draws of the Middle Concho. Common on the east side of Pecos River. Probably breeds.

591. **Pipilo fuscus mesoleucus** (Baird). [240.] *Cañon Towhee.*

This Towhee occurs as far north as Colorado, but enters our district in Texas only, where Mr. Lloyd found it a tolerably common resident in Tom Green County.

593. **Cardinalis cardinalis** (Linn.). [242.] *Cardinal.*

The Cardinal inhabits all of the Mississippi Valley east of the plains and south of southern Nebraska and southern Iowa, and has been found occasionally in Minnesota. South of latitude 41° it is stationary, while north of this parallel some remain in the winter, but most go south. Dr. Watson gave it as rare at Ellis, Kans., but Mr. Lloyd found it common at San Angelo, Tex. Mr. Widmann said of its winter habits at Saint Louis: "It is here one of the most numerous of the winter birds, occurring in pairs, family groups, and flocks, and remaining at or near the breeding grounds all winter. In hard times corn is the chief attraction." At Caddo, Ind. Ter., its habits were somewhat different. During the fall, Cardinals were found among the thick, tall weed patches around the cotton fields; they were silent and so shy that they were seldom seen, sheltering themselves in the almost impenetrable mass of foliage. During the latter part of November, when most of the leaves had fallen, they retreated to the thickets along the stream. Here they staid in great numbers until real winter, when they began to flock into town, and as long as snow lasted they could be found everywhere around the houses where not one had been seen for several months. A warm period would find them back in the thickets, only to return with the next cold snap. The most northern record received was from Iowa City, Iowa, where one was seen April 17, but it may have been an escaped cage-bird.

In the spring of 1885 two Cardinals were seen in January at Morning Sun, Iowa, but they were not recorded during the winter of 1884–'85 from any other place in Iowa. They returned to Ferry, Iowa, March 29, and to Denmark, Iowa, April 19. A set of six eggs was taken at Peoria, Ill., May 7.

In the fall of 1885 a Cardinal was taken at Iowa City, Iowa, October 29, being the first one captured in that county that was certainly a wild bird. At Saint Louis, Mo., large flocks of these birds were present September 23. They were most numerous October 6, and decreased October 20.

594. Pyrrhuloxia sinuata Bonap. [243.] *Texas Cardinal.*

The Texas Cardinal is a southern species resident wherever found. In 1884 it was noted at San Antonio and Eagle Pass, Tex., and its range extends thence south and west. It is especially abundant from Eagle Pass southward. At Boerne, Tex., Mr. Brown secured a pair in 1883—the female February 2, and the male April 5.

In the spring of 1885 a male was taken at San Angelo, Tex., April 26. This I believe to be its most northern record.

Pyrrhuloxia sinuata beckhami Ridgw. [—.] *Arizona Pyrrhuloxia.*

The type of this newly described subspecies was taken at El Paso, Tex., by Lieut. J. G. Parks, U. S. A. (Auk, Vol. IV, No. 4, October, 1887, p. 347). It has been found also in southern Arizona and New Mexico.

595. Habia ludoviciana (Linn.). [244.] *Rose-breasted Grosbeak.*

Breeds from about latitude 37° northward; tolerably common in Manitoba. The spring migration of this species is evidently carried on in a northeasterly direction. It is found in Mexico and Central America during the winter; but during the summer it is entirely a bird of the eastern province, rarely breeding as far west as eastern Kansas (where it is common during migration). Mr. Ragsdale has never seen it at Gainesville, in north-central Texas, and Professor Nehrling does not mention it in his Birds of Southeastern Texas.

The southernmost station reporting the Rose-breasted Grosbeak in 1884 was Saint Louis, Mo., where the first male was noted April 26, followed two days later by the bulk of the males. April 29 and 30 they appeared in Illinois up to latitude 39° 43′, with an accidental one at Waukon, Iowa (lat. 43° 15′); and the first two days of May found them in Illinois north to latitude 40° 08′, and to latitude 41° 40′, in Iowa. The advance was quite regular over northern Illinois, Wisconsin, and Minnesota, bringing the van of males to latitude 44° 22′, in Wisconsin, and 44° 32′, in Minnesota, May 8. By May 10 they had reached Elk River, Minn. (lat. 45° 25′), and May 28 they were noted at Portage la Prairie, Manitoba (lat. 50°), which is nearly as far north as the species occurs. The average of the data received from seven stations indicates that the arrival of the first female was about five days later than that of the first male, while the arrival of the general bulk of the species was about one day later. In the south the difference in the times of arrival of males, females, and bulk was greater than in the north, the indications being that in approaching the northern limits of its range the females traveled with the bulk, and were only two or three days behind the van.

In the fall of 1884, at Des Moines, Iowa, the last Rose-breasted Grosbeak was reported August 29.

In the spring of 1885, as usual, the record of the first at Saint Louis was considerably earlier than from corresponding stations farther east or west. It was seen there April 20; at Mount Carmel, Mo., April 25, and at Paris, Ill., April 30. This last date is probably a little late, since on the two preceding days it had been noticed at Peoria, Griggsville, and Aledo, Ill., and also at Des Moines and Keokuk, Iowa. A second wave passed over this same part of Iowa May 1. A few scattering individuals were noted May 6 and May 7 at Lanesboro, Minn., Elk River, Minn., and La Crosse, Wis. These were followed, May 11 and May 12, by a heavier advance, which reached Heron Lake, Rochester, Lake City, Hastings, and Elk River ("common"), in Minnesota, and Ripon and Durand, in Wisconsin. The first in Manitoba was noted at Shell River, May 16. In Kansas and Nebraska, where this bird is rarely found, the movement was much delayed, and at Manhattan, Kans., and Unadilla, Nebr., the first was not recorded until May 16.

In the fall of 1885 the only regular notes on this species came from Saint Louis, where it was common September 16, very numerous September 22, bulk present September 25, and bulk departed September 29. At the regular stands the last was seen October 6, and none were seen after October 11. The notes from other stations were very irregular. The last was reported from Elk River, Minn., September 9, and from Grinnell, Iowa, August 9.

596. **Habia melanocephala** (Swains.). [245.] *Black-headed Grosbeak.*

The summer range of this Grosbeak extends from the plains westward; it winters in Mexico. During the spring migration it enters Arizona and New Mexico in April. The majority pass north in the Rocky Mountain region, but some move northeastward over the plains and are found in the valley of the Rio Grande, in western Kansas, in Nebraska, and in Dakota. In western Kansas it is not uncommon in summer. Professor Lantz and Dr. Blackly have shot it at Manhattan, Kans., and July 11, 1884, Colonel Goss saw a male as far east as Topeka, Kans. Mr. Powell has taken it at Alda, in southeastern Nebraska, and Dr. Agersborg in southeastern Dakota. It has occurred accidentally in Michigan. The most eastern record in Texas was from Mason, where a single male was secured by the Rev. I. B. Henry. It was reported also from Colorado City, near the one hundredth meridian, and from San Saba County (long. 98°), where Mr. Ragsdale took one in 1879. Mr. Lloyd states that it is a rare summer visitor in Concho County, Tex.

In the spring of 1885 the first Black-headed Grosbeak was seen at Mason, Tex., May 4, and at Emporia, Kans., May 10.

597. Guiraca cærulea (Linn.). [246.] *Blue Grosbeak.*

The Blue Grosbeak is a southern species. Both it and the Black-headed winter in Mexico, but while in spring the bulk of the latter migrate north to Colorado and Utah, the present species moves a short distance north and a long distance east, sometimes even to New England. In middle and western Kansas it is a common summer resident. In its migration it reaches southern Illinois and southern Nebraska. In the spring of 1884 it arrived at Gainesville, Tex., April 25; at Pierce City, Mo., May 9, and was very common. At Manhattan, Kans., the first was seen May 10, but it was not common until the last of the month. It was seen at Ellis, Kans., May 13; at Lawrence, Kans., July 5, 1884. Col. N. S. Goss saw a pair of Blue Grosbeaks followed by three fledged young.

In the spring of 1885 the records of the migration of the Blue Grosbeak were unaccountably irregular. They are as follows: The first was seen at San Antonio, Tex., May 6; at Mason, Tex., April 20; at Gainesville, Tex., April 18; at Pierce City, Mo., May 9; at Emporia, Kans., May 12; and at Manhattan, Kans., May 2. At Manhattan they had become common by May 12. In Texas it is a "tolerably common migrant in fall from the Pecos River to the Colorado River; breeds abundantly farther west" (Lloyd). In southeastern Texas it is a "regularly distributed summer resident, but nowhere abundant" (Nehrling).

598. Passerina cyanea (Linn.). [248.] *Indigo Bunting; Indigo Bird.*

The Indigo Bird is found all over the Mississippi Valley, east of the plains. Elk River, Minn., is very near the northern limit of its range; north of this it only occurs locally (in three years' residence at latitude 47°, in Minnesota, it was not seen). It usually leaves the United States in winter Mr. Bibbins says he has seen it as an occasional winter visitant at Mermenton, La. In the spring of 1884 it had advanced up the valley to Pierce City and Saint Louis, Mo., by April 29. May 3 it was seen at Carlinville, Ill., and two days later at Glasgow, Mo., while on the same day it was noted at Manhattan, Kans. Its presence is thus very accurately fixed at this date, but for the next two weeks the records were so at variance that it is probably the nearest approximation to say that on May 10 the normal van was in northern Illinois and northern Iowa. May 15 it was reported in Minnesota from Lake City and Pine Bend; May 23 from Minneapolis, but not until June 2 from Elk River. It may not be out of place here to give Mr. Widmann's full record from Saint Louis, as showing how many changes take place in the individuals present at different times. His record reads:

> April 28, first, a male in song; April 29, an increase, a small flock of males; April 30, males in song in a few places; May 5, the bulk of the males and the first female arrived; May 6, males everywhere in noisy flocks and many transients. These two days (May 5 and 6) were the height of the season for males. May 9, the bulk of young males and the bulk of females arrived; birds mating: May 21, nest building; May 31, they were one of our most industrious songsters.

In the fall of 1884 the bulk of Indigo Buntings left Williamstown, Iowa, August 19, and the last August 28. At Mount Carmel, Mo., the last was noted August 29. Mr. Lloyd says that it is a rare fall migrant in Tom Green County, Tex.; and Mr. Nehrling states that in southeastern Texas it was "observed only during the migrations."

In the spring of 1885 it was recorded from San Antonio, Tex., April 16. It reached Gainesville, Tex., April 20; Pierce City, Mo., April 21, and Saint Louis, Mo., April 23. The notes from stations east of the Mississippi River were too irregular to be satisfactorily worked up, but those west of the Mississippi indicate that the species reached latitude 42° May 10 and May 11; latitude 43° May 14; latitude 44° May 19, and latitude 45° May 21. The most northern record was from Elk River, Minn. (lat. 45° 25′), May 27.

In the fall of 1885 the last Indigo Bunting was reported from Elk River, Minn., September 7; from Grinnell, Iowa, September 28; Iowa City, Iowa, August 29; Fayette, Mo., October 1, and from Mount Carmel, Mo., August 9. At Saint Louis, Mo., they were numerous September 9; they were very common September 22; the bulk was present September 25; they had decreased by October 6; they were seen in several places October 11; the last one at their regular stands was seen October 14, and none were seen after October 17.

599. Passerina amœna (Say). [249.] *Lazuli Finch; Lazuli Bunting.*

West of our district the Indigo Bunting is replaced by the present species, which seldom enters the Mississippi Valley. Its true home is from the plains westward. It is common on the Missouri, in central Dakota, and thence westward (Allen). The only records from the observers came from Dr. Agersborg, who finds a few every summer at Vermillion, Dak., and from Dr. Watson, who found it a rare summer resident at Ellis, Kans.

600. Passerina versicolor (Bonap.). [250.] *Varied Bunting.*

The home of this remarkably colored bird is in eastern Mexico and the Lower Rio Grande Valley in Texas, where it is tolerably common (Sennett; Merrill). A straggler (or an escaped cage bird) has been taken in Michigan (Dr. H. A. Atkins).

601. Passerina ciris (Linn.). [251.] *Painted Bunting; Nonpareil.*

A southern species whose northern limit barely reaches southern Kansas and southern Illinois. In the spring of 1884 it crossed our southern border after summer was fully here, and did not go far north It arrived at Mason, Tex., April 25; at Rodney, Miss., the next day, and two days later at Gainesville, Tex. At Caddo, Ind. Ter., it was an abundant breeder. Mr. Lloyd writes that at San Angelo, Tex., the male of this species is the first summer bird to depart, the female remaining six weeks or so later. It breeds from May 2 to July 14, raising two broods. There is one record in Illinois of its occurrence near Mount Carmel. In May, 1885, Col. N. S. Goss found it breeding plentifully in Comanche County, southern Kansas (The Auk, Vol. II, 1885, p. 276).

In the fall of 1884 the last male Nonpareil was seen at San Angelo, Tex., July 29, while a female and young were seen September 6. In 1883 they were seen as late as September 14.

In the spring of 1885 the first came to Houma, La., April 1; San Angelo, Tex., April 9; Bonham, Tex., April 17; and Gainesville, Tex., April 19. The following account of the breeding habits of the Nonpareil, from the pen of Mr. H. F. Peters, of Bonham, Tex., will be interesting to Northern readers who are unacquainted with the bird:

> The Nonpareil is one of my pets, and as I have five or six pairs breeding in my yard every year I have a good opportunity to watch them. They arrive here at Bonham from the 10th to the 20th of April, the males coming some ten days or more before the females. The males spend their time playing and frolicking until the arrival of the females, when the playing turns to courting and fighting. It is both interesting and amusing to watch the male trying to attract the attention of the female. He will hop down on the ground, spread his wings and tail, strut around and cut all sorts of capers. The first time I saw it done I thought he was wounded, and started towards him to pick him up, but soon learned my mistake. They are not very quarrelsome birds, and soon commence to pair. At this period the male is very attentive, but after nest building has commenced he is quite another bird. He helps to find the place to build, and appears to be very particular about it, but as soon as it is decided upon he retires from business. He never works; he is a little dude, too finely dressed to do any labor. I have frequently seen him sitting a few feet above the nest, singing unconcernedly, while his mate would be struggling with a yard or two of twine, or a piece of old rag to weave into the nest. I have never seen the male help in nest building, or in feeding the young while in the nest, but have seen him feed the young after they were fledged. A cat caught a female when the young were unfledged, and I watched her mate to see if he would raise the young. He never fed them once. He let them die, and went off and found another mate who raised a family of young not more than 6 feet from the other nest. While the female is very gentle and tame, frequently coming to the door in search of material for the nest, and food for the young, the male is shy and keeps at a distance. When the young are full grown he troubles himself no more about them. The middle of August he leaves wife and family and goes south to his winter home. The female and young remain until the second week in October.

602. **Sporophila morelleti** (Bonap.). [252.] *Morellet's Seed-eater.*

A tropical American bird, coming north to the Lower Rio Grande Valley in Texas, where it is not uncommon (Merrill; Sennett).

604. **Spiza americana** (Gmel.). [254.] *Dickcissel; Black-throated Bunting.*

A rather southerly species, passing north to latitude 45° in the Mississippi Valley, and wintering entirely south of the United States. Mr. J. A. Allen found a few in western Dakota, near latitude 47°, in the summer of 1873. It breeds abundantly in southeastern and western Minnesota and eastern and middle Kansas. J. C. Hvoslef writes June 18, 1887, from Lanesboro, Minn., "*Spiza americana* is now one of our most common birds." In eastern Texas it breeds abundantly in all the prairie districts (Nehrling). In the spring of 1884 the first noted was seen at Gainesville, Tex., April 15. No more was heard of the species until April 26, when a single breeder and two transients came to Saint Louis. On the next day the bulk arrived at Newport, Ark., and was two days in passing from there to Saint Louis. The same day the first reached Manhattan, Kans., and the last day of the month they were noted from latitude 40° 47′ in Nebraska, and from Chicago, Ill. May 5 they were noted from latitude 41° 36′, in Iowa, and latitude 41° 58′, in Illinois, while they reached latitude 42° 01′, in Iowa, May 7. They were now nearing the northern limit of their range and the movement was slower. Not until May 24 were they seen at latitude 44° 45′ in Wisconsin; the bulk was recorded from latitude 43° 43′ in Minnesota, June 4, and from Pine Bend, Minn. (lat. 44° 47′), June 26. The full report from Saint Louis is subjoined: "April 26, the first breeder and two transients; April 28, still scarce; April 29, bulk of males arrived, many at stands and often seen on the wing going east; April 30, males noisy at stands; May 5, bulk of females arrived. This was the height of the mating season. Several parties were seen on the wing going east in the morning. May 9, young males arrived; May 20, young birds were still coming, and the species was usually seen in pairs." It breeds abundantly in southeastern Dakota.

In the fall of 1884 the last Black-throated Bunting left Des Moines, Iowa, August 29. The bulk left Mount Carmel, Mo., September 6, and the last September 20. At Unadilla, Nebr., none were seen after August 23. At San Angelo, Tex., where it is an abundant migrant, the first appeared November 6, and the last was seen November 23.

In the spring of 1885 the movements of this species differed radically from the record of them for 1884. In the spring of 1884 the first was seen at Gainesville, Tex., eleven days before any were seen at Saint Louis, Mo. In 1885 the first was reported at Saint Louis April 20, the same day that the first was seen at San Antonio, Tex., and three days before the first appeared at Gainesville. The other records of 'firsts' were: Mount Carmel, Mo., April 24, and Manhattan, Kans., April 29. Irregular and early birds were seen at Newton, Iowa, April 25, and at Hennepin, Ill., April 26. The van of the regular migration reached this section during the first five days of May, and was recorded from Odin, Ill.; Peoria, Ill.; Tampico, Ill.; Des Moines, Iowa; Grinnell, Iowa, and Unadilla, Nebr. May 11 the first was recorded from Hastings, Minn.; May 16, from Heron Lake, Minn., and during the summer from Huron, Dak., which is near the northwestern limit of its range. The whole record from Saint Louis is as follows:

> "April 20, first one in air going east; April 23, second; April 28, many going east and north; May 4 and May 5, bulk of males arrived; May 9, males numerous, females scarce; May 13, bulk of females arrived; May 14, height of the season, young birds arrived."

In the fall of 1885 none were seen at Huron, Dak., after July 7; Iowa City, Iowa, August 29; Mount Carmel, Mo., September 20, and Saint Louis, Mo., September 26.

605. **Calamospiza melanocorys** Stejn. [256.] *Lark Bunting.*

This is a bird of the plains, wintering abundantly in central and southern Texas, even as far east as the prairies about Houston (Nehrling), and thence southward into Mexico. The most southeastern records are the following: Mr. Nehrling found it abundant in winter about Houston, Tex. In the valley of the Lower Rio Grande, in Texas, it is a rather common winter resident (Merrill). In the winter of 1883–'84 it occurred in immense flocks at San Angelo, Tex., remaining until May 17. At Mason, Tex., a few were found in summer. Mr. Ragsdale says that it is "irregular" at Gainesville, Tex., where it was seen February 21, 1876. Passing north to middle and western Kansas, where it is an abundant summer resident, the first arrival was noted May 10. May 11 Dr. Hvoslef saw one on the high prairie 9 miles east of Lanesboro, Minn. Since Dr. Hvoslef saw a male near the same place June 19, 1883, the species probably is a semi-regular visitant to southern Minnesota. It has been found breeding abundantly in central and southeastern Dakota, and also in western Minnesota, along Traverse Lake and the Red River of the North.

In the fall of 1884, at San Angelo, Tex., the first migrant, a male, was seen October 23.

In the spring of 1885 the first returning flocks appeared at San Angelo, Tex., March 26. Birds, probably of this species, came to Bonham, Tex., April 29; they were common there May 11, and left May 24. They had previously left San Angelo, May 8, and San Antonio, Tex., May 9. At Huron, Dak., the first were seen May 13.

606. **Euphonia elegantissima** (Bonap.). [160.] *Blue-headed Euphonia.*

This species inhabits Central America and eastern Mexico, coming north to Texas (Giraud).

607. **Piranga ludoviciana** (Wils.). [162.] *Louisiana Tanager.*

This beautiful Tanager may be found in suitable localities from the Great Plains to the Pacific. In the spring of 1886 a specimen was shot on the South Concho in Texas (Lloyd). It breeds in Black Hills of Dakota.

608. **Piranga erythromelas** Vieill. [161.] *Scarlet Tanager.*

A common summer resident in most parts of the Mississippi Valley east of the plains, and north of latitude 37° (doubtless breeds still farther south in some places); rare as far north as Manitoba.

Few birds are better known than the gorgeous male of this species, and its record is correspondingly full. It has been taken once as far west as El Paso, Tex. In southeastern Texas, near Houston, it is a moderately common migrant (Nehrling).

In the spring of 1884 it was reported as arriving at Eagle Pass, Tex., February 29. No more records were given until April 27, when it appeared at Keokuk, Iowa, and Danville, Ill. This was several days earlier than the dates from neighboring stations; but with so striking and well-known a bird there is small chance for a mistake.

The first week in May seems to have marked its general advance to latitude 42°. A few were seen along latitude 45° May 10 and 12, but the van did not reach that latitude until May 24. One was seen May 26 at Oak Point, Manitoba, latitude 50° 30′. The only record in the West came from close to the western limit of its range: It reached Manhattan, Kans., April 30, and the bulk was present May 10.

In the fall of 1884 the bulk and last of the Scarlet Tanagers left Williamstown, Iowa, August 4. At Des Moines, Iowa, the last was seen August 1; and at Mount Carmel, Mo., September 11.

In the spring of 1885 the first note came from St. Louis, Mo., April 22. Farther west, in the same latitude, the first was seen at Mount Carmel, Mo., April 26, and at Manhattan, Kans., May 1. Latitude 41°, in western Illinois, was reached April 24, and the rest of northern Illinois, the southern edge of Wisconsin, and central Iowa on May 5 and May 6. There was no more advance until May 14 and May 15, during which days they passed to Green Bay, Wis., and Elk River, Minn.

In the fall of 1885 the last left Elk River, Minn., August 6. The last was reported at Fayette, Mo., September 1, and at Saint Louis, Mo., September 17.

610. Piranga rubra (Linn.). [164.] *Summer Redbird.*

Breeds from the middle portion of the Mississippi Valley southward. A common summer resident in eastern Kansas. Were the movements of all species as regular as those of the Redbird seem to be, the study of migration would be simple enough. Records were received from two lines of migration, and there is not an irregular record among them. From its winter home it was rather late in entering the United States, reaching Mason, Tex., April 12, and Gainesville, Tex., April 15. It was reported from Darlington, Ind. Ter., May 3; Pierce City, Mo., May 17; and May 31 it was found near its ordinary northern limit at Manhattan, Kans. Along a line of migration east of the Mississippi, it came to Rodney, Miss., April 11; Waverly, Miss., April 20; Saint Louis, Mo., April 29; and Carlinville, Ill., the next day. Such a regular record has never before been contributed, and a duplicate will seldom be found. The most western station from which it was reported is San Angelo, Tex., where it is a tolerably common breeder.

In the fall of 1884 the last Summer Redbird left San Angelo, Tex., September 19.

In the spring of 1885 no such regularity appeared in the record as was noted in 1884. The first was seen at San Angelo, Tex., April 6; Corinth, Miss., April 7; Gainesville, Tex., April 10; Shawneetown, Ill., April 19; Saint Louis, Mo., April 27; Mount Carmel, Mo., May 1, and Hennepin, Ill., May 12. The first females and young birds came to San Angelo, April 16.

611. Progne subis (Linn.). [152.] *Purple Martin.*

Breeds locally throughout Manitoba and the Mississippi Valley to the Gulf of Mexico. There is some doubt whether this bird ever spends the winter in the United States. Mr. Edwards says that he does not think it occurs in southern Louisiana in winter proper, unless perhaps during protracted periods of warm weather, which sometimes occur in December. Most other writers say decidedly that all leave the United States in cold weather. Certain it is that none remained in the Mississippi Valley in the winter of 1883–'84. They crossed our border the last week in February, but seem to have been few and scattered. The first was noted at Water Valley, Miss., March 1, and March 5 a few were seen at Gainesville, Tex., and Caddo, Ind. Ter., but no more followed for some days, and on this date they were marked at Abbeville, La., as still remaining in the same numbers as when they arrived ten days before. March 9 the first male appeared at Rodney, Miss., and was followed ten days later by the first female. By March 11, they returned to Caddo, Ind. Ter.; were seen at Newport, Ark., and also at Waverly, Miss. Still, all these were merely scouts, and it was not until March 13 and March 14 that the species become common in the Gulf States. On these days they were marked as numerous at Eagle Pass, Tex., and as arriving more plentifully at Abbeville, La., and beginning to sing a little. March 21 this regular advance moved to southern Missouri, at latitude 36° 56′ and latitude 37° 08′, and March 24 to Saint Louis. The next day it was noticed at Griggsville, Ill., and Manhattan, Kans. March 26, more came to Manhattan, and on the same date it was reported from latitude 39° 09′ and latitude 39° 14′, in Missouri, and an irregular scout moved to Tampico, Ill. (lat. 41° 36′). March 30 and April 1 a small company invaded southeastern Iowa, appearing at four stations, and April 3 some of them even reached latitude 41° 42′, in Iowa, and latitude 43° 43′, in Minnesota, but this was their last effort before the April storms drove them southward. We find no records from April 3 to April 10. On this latter date they began moving northward, being seen at places in the rear of the position of the van of April 1. About April 14 the advance was fairly under way and had proceeded northward through the rest of Iowa to latitude 43° 43′ in southern Minnesota, and through northern Illinois to latitude 43° 06′ in Wisconsin, with a scout north in Wisconsin to latitude 44° 30′. April 16 marked an advance to latitude 44° 26′, in Minnesota; April 17 to latitude 44° 32′ and latitude 45°; and April 18 to latitude 45° 25′. Then came a long pause, and it was not until after May 1 that any more movements were recorded. May 3 the species appeared at latitude 46° 33′ in Minnesota, and latitude 47° 52′ in Dakota, though it is probable that the former of these dates is later than the normal. May 19 they were seen at Portage La Prairie, Manitoba, and May 23 at Oak Point, Manitoba. Mr. Small, the observer at Oak Point, says that they were the first he ever saw there. It is probable that in the line of migration from New Orleans to Lake Winnepeg almost the entire migration took place during the following twelve nights: March 10, 20, 25, 27; April 11, 12, 13, 17; May 3, 9, 17, and 19. The distance is 1,440 miles, hence the average speed must have been 120 miles a night for every night of movement. To show how much can be learned from the study of the movements of a single species in a single locality, the full record from Saint Louis is given. Mr. Widmann had a number of Martin houses set up in his back yard, and kept a full and accurate account of all the movements which took place there. His record reads:

> March 24, at 5.45 p. m., the first birds were seen, being three scouts; March 25, at 4.45 p. m., the first of our Martins, one male; March 28, second male arrived; March 29, first transient seen passing; March 30, first female arrived and several transients went north; March 31, an increase, ten per cent. were now present; April 3 to 13 there was no increase in our colony; April 13 it increased to ten birds, the next day to sixteen, and April 16 it numbered eighteen (ten males and eight females). April 17 added one male and one female; April 18 there were nine pairs and three odd males in the boxes; April 23 about a dozen refugees from the north crowded into the boxes at night, and among them was the first male of last year in a half-starved condition; April 25 all the transient visitors were off again; our colony now numbered twenty-three birds; April 26, twenty-seven birds; April 27, twenty-eight birds; April 30, thirty birds. The bulk of the species arrived during these last five days. During the first week of May the numbers gradually increased to thirty-four birds. May 10 the last increase of old birds occurred, and now there were eighteen pairs that had taken quarters. May 11 the bulk of last year's birds were present, but did not take possession of nor sleep in the boxes. May 13 all old Martins were building earnestly, and some have been sitting on eggs since about May 9; May 20 the first pair of young birds took possession of a box and began to build; May 18 first eggs hatched; May 24 the second pair of young took a box, and June 5 the third pair did likewise.

In the fall of 1884 the last Purple Martin at Williamstown, Iowa, was seen August 19, and at Unadilla, Nebr., August 13. The bulk left Des Moines, Iowa, September 1, and the last seen was September 11. None were seen at Mount Carmel, Mo., after August 18.

In the spring of 1885 the Purple Martin did not remain long in its winter home, but returned to the United States early in February. It was seen at Houma, La., February 8, and at San Antonio, Tex., February 23. Those seen at Houma were probably irregular migrants, for no more were reported from the other stations in Louisiana until the last of the month. Those at San Antonio must have been part of the regular advance, since only two weeks later (March 6 and 7) Martins were reported from Bonham and Gainesville, Tex. During the month of March the Martins passed from latitude 30° to latitude 38°. The exact date of their movements can not be told, for in the year 1885 there was not a single observer in the country along the Mississippi River from New Orleans to Saint Louis. Here lies a vast area, 200,000 square miles in extent—larger than the whole United Kingdom of Great Britain—and yet the most thorough and painstaking search failed to discover one person sufficiently interested in the study of ornithology to make a record of the movements of birds!

The Purple Martins were reported from Emporia, Kans., March 26; Corinth, Miss., March 28, and a straggler was seen the same day at Fayette, Mo. The grand wave of migration, the largest of the whole season, passed up the Mississippi Valley during the last two days of March, and the first day of April. During these three days the arrival of Martins was noted at Pierce City, Mo.; Reeds, Mo.; St. Louis, Mo.; Glasgow, Mo.; Richmond, Kans.; Manhattan, Kans.; Shawneetown, Ill. (two observers); Paris, Ill.; Peoria, Ill.; Tampico, Ill.; Chicago, Ill.; Milwaukee, Wis.; Knoxville, Iowa; Iowa City, Iowa, and Unadilla, Nebr. A slight pause followed (on April 2 and 3), but the onward move began again April 4, and by April 5 Martins were reported from Morning Sun, Iowa; Ferry, Iowa; Des Moines, Iowa; Newton, Iowa; Laporte City, Iowa; Waukon, Iowa; Rochester, Minn.; Lake City, Minn.; Hastings, Minn.; Milwaukee, Wis.; Lake Mills, Wis.; and New Richmond, Wis. The boundaries of this movement are pretty clearly defined by the records. It was most pronounced close to the Mississippi River, where it reached the farthest north. The northern boundary of the area affected by this wave runs northwestward from latitude 43° on Lake Michigan, to latitude 45° on the Mississippi River, and then southwestward to latitude 41° on the Missouri River. New Cassel and Green Bay, in central Wisconsin, were reached April 9, but there was no record of a corresponding advance in the Missouri Valley until April 20, when Huron, Dak., was reached. At this time the Martins had passed up the Mississippi River to Minneapolis and Elk River, Minn., and on this day (April 20) three pairs appeared at Detroit, Minn. No further advance was recorded for nearly a month. Not until May 13 were any seen at Argusville, Dak. They reached Oak Point, Manitoba, May 17. No material was received from which the movements of the bulk could be learned. The full record from Saint Louis, Mo., is as follows:

> March 30 the first, a male, arrived at 7.40 a. m.; at 8.14 a. m. two males passed north; 9.25 a. m. another followed, and 5.30 p. m. a party of ten passed, going north. March 31, an increase of summer sojourners; nine were seen at one time in the air; the first female arrived, and two males selected the boxes which were to be their summer homes; April 1 three pairs and one male took boxes; April 2, further increase; twelve Martins took boxes; April 7 the above number was increased to fourteen; April 14 twenty took boxes; April 15 twenty-four took boxes; April 20 thirty took boxes; April 30 thirty-seven took boxes and nest-building began; May 13, young pairs (birds one year old) began nest-building; May 15, young pairs were still increasing.
>
> In the fall of 1885 great numbers of Martins were present at Saint Louis, Mo., August 9 in the evening; they were also numerous August 12 and 13; August 14 their numbers had decreased only to be re-inforced August 17. The bulk had gone August 26, and but few went to roost. The last great wave of the migration passed during September 8 and 9, and none were seen after September 11.

The remainder of the fall notes record the departure of the last from Fernwood, Ill., August 29; Fayette, Mo., August 25; Mount Carmel, Mo., August 9; Shawneetown, Ill., August 13; and from Bonham, Tex., August 20. It is probable that these early dates of leaving apply to the summer residents, and that the observers were so situated that they did not happen to note the last passing migrants.

612. Petrochelidon lunifrons (Say). [153.] *Cliff Swallow.*

An abundant breeder over the whole of the Mississippi Valley and Manitoba. Mr. Lloyd states that it breeds plentifully in Tom Green and Concho Counties, Tex.; and Dr. Merrill states that it is an abundant summer resident in the Lower Rio Grande Valley, in Texas, where it is the only Swallow that remains to breed. To see these Swallows in their glory, one should visit some of the great rivers of the western plains. Professor Aughey tells us that he counted in one place 2,100 nests. Leaving the United States in winter, it does not re-appear as soon as the White-bellied Swallow or the Purple Martin. In the spring of 1884 it began to return about the middle of March, and was very plentiful at Eagle Pass, Tex., March 27, whence it advanced rapidly to about latitude 40°, and then came to a halt. One was seen at Saint Louis April 15, and the species had already been noted from Burlington, Iowa, April 10. There is something singular about these records from Burlington and Saint Louis. On three species of Swallows the record at Burlington, though 150 miles farther north, was some days ahead of that at Saint Louis. The White-bellied was seen at Burlington March 10, at Saint Louis March 24; the Barn Swallow at Burlington April 10, at Saint Louis April 16; the Cliff Swallow at Burlington April 10, at Saint Louis April 15. After reaching Saint Louis and Burlington there was a pause in the movements of the Cliff Swallow until April 25, when it again started northward. By May 1 these Swallows were over all the country south of latitude 45°; May 17 they reached Portage la Prairie, Manitoba, and May 22 Oak Point, Manitoba. April 27 seems to have been a special day of migration in the West. On this day the species appeared over most of western Missouri and eastern Kansas. At Caddo, Ind. Ter., it was abundant in fall migration, the last leaving October 9, but none had returned by April 7, though at that time the Purple Martin had been there about a month. The Cliff Swallow rarely breeds south of the parallel of 38°, hence the following note from Waverly, Miss. (lat. 33° 34′), is particularly interesting. April 10 a pair of these Swallows appeared and soon commenced house-building. Two broods were raised, and the nest, which was a great curiosity in that country, is still preserved. They were also found nesting in May at San Angelo, Tex. Had one seen the thousands and thousands of these birds which, one evening in the latter part of July, were resting on a marsh near Red Rock, Ind. Ter., he would have been tempted to believe that Professor Aughey's two thousand nests had poured out their entire contents on this particular place.

In the fall of 1884 the last Cliff Swallow was reported from Williamstown, Iowa, August 28, and from Unadilla, Nebr., September 5. The bulk left Williamstown July 17.

In the spring of 1885 a comparison of the records of the Cliff and White-bellied Swallows shows that these two species have been confounded by several of the observers east of the Mississippi River. The earliest record which really belongs to the Cliff Swallow is that of its arrival, April 12, at Paris, Ill. A single bird was seen at Tampico, Ill., April 18; and April 19 a few were noticed at a colony near Saint Louis, Mo. April 20 and 21 they reached Aledo, Ill.; Richmond, Iowa; Manhattan, Kans.; Clinton, Wis.; Lake Mills, Wis.; and New Cassel, Wis. They reached Lanesboro, Minn., April 23, and Lake City, Minn., April 26. North of these places migration was greatly delayed, apparently by the storms of the early part of May. Not until May 10 were Cliff Swallows noted from Minneapolis, Minn., and they were not reported from River Falls, Wis., until May 17. At Shell River, Manitoba, they arrived May 23.

In the fall of 1885 there was a great migration of Cliff Swallows past Saint Louis, Mo., September 8 and 9, and they were still present in numbers September 11. None were seen at Saint Louis after September 14, but one was observed at Grinnell, Iowa, September 16.

613. Chelidon erythrogaster (Bodd.). [154.] *Barn Swallow.*

A common summer resident throughout the Mississippi Valley, which it enters from the south very early in the spring; tolerably common in Manitoba. Mr. Lloyd states that in Tom Green and Concho counties, Tex., it raises two broods. March 6, 1884, it was found building at Eagle Pass, Tex. Farther east, and a little north (at Abbeville, La.), it was not seen until March 27; at Gainesville, Tex., the first one came April 1, and at Rodney, Miss., one was seen April 4. On the same day one appeared at Reeds, Mo. April 10 they were recorded at Fayette, Mo., and Burlington, Iowa, but the birds seen must have been stragglers, for none were reported from the neighboring stations till some time later.

Seven reports were received from Iowa in addition to that from Burlington, and all but one put the date of arrival later than May 1—most of them in the first week of May—while the records from northern Illinois and southern Wisconsin were all in April, from the 21st to the 27th. At Pine Bend, Minn., the first came May 2, and at Menoken, Dak., May 12. It must be confessed that this record looks rather mixed, and yet it is hardly to be wondered at when we consider the remarkable power of flight of the Swallow. Distance is nothing to it, and favorable atmospheric conditions for a few hours only might bring certain individuals north far beyond their fellows. At Saint Louis, Mo., Mr. Widmann found old pairs at their breeding places April 28, but the new pairs came and selected breeding places in May, even as late as May 22.

In the fall of 1884 the bulk of Barn Swallows left Williamstown, Iowa, August 28, and the last was seen September 9. The bulk left Mount Carmel, Mo., August 26, and the last was seen there September 6.

In the spring of 1885 the records of this species extended from March 1, when it reached Eagle Pass, Tex., to May 30, when it was reported from Ossowo, Manitoba. Hence it was ninety-one days in traversing

1,500 miles. At intermediate points it was noted at Emporia, Kans., April 11; Richmond, Kans., April 15; Unadilla, Nebr., April 28, and Menoken, Dak., May 13. Nearer the Mississippi River it was seen at Abbeville, La., March 15; Pierce City, Mo., April 9; Saint Louis, Mo., April 11; Paris, Ill., April 12; Hennepin, Ill., April 17; the southern edge of Wisconsin, northern Illinois, and the southern edge of Iowa, April 19; central Iowa April 22 and 23; central Wisconsin April 29; but no part of Minnesota was reached until after the cold wave had left, about the middle of May. In the fall of 1885, at Milwaukee, Wis., the last Barn Swallow was seen August 31. Great numbers passed Saint Louis, Mo., September 8 and 9, and the last disappeared September 14.

The note which I put into the Ornithologist and Oologist for April, 1884, page 37, concerning the commonness of this species during the winter in southern Louisiana, was not correct. Mr. Edwards, of Abbeville, La., informs me that it is seldom found there in winter, unless perhaps when a long period of warm weather occurs, which happens sometimes in December. But, however that may be, it enters the United States very early.

614. **Tachycineta bicolor** (Vieill.). [155.] *White-bellied Swallow.*

Breeds abundantly in Manitoba and most parts of the Mississippi Valley. This is the only swallow which winters regularly and abundantly in the United States. From its winter quarters in the Southern States it spreads north the earliest of its tribe. Indeed, so early is its migration that it is often overtaken by snow-storms, before which it usually retreats, though sometimes it remains to brave the elements. At Gainesville, Tex., in the spring of 1884 it did not arrive until April 30, though in former years it has been known to come by March 3. Nearer the Mississippi River, migration must have started early in March, probably when the warm wave set in, March 8 and March 9. A single bird was seen at Burlington, Iowa, March 10, but the regular advance occurred about two weeks later. If records of first arrivals are to be relied upon they show that the migration of this swallow took place much earlier east of the Mississippi than west of it. In Illinois and Wisconsin the records of "firsts" were: At Tampico and Chicago, Ill., March 24 and 26; at Lake Mills, Wis., April 4; and at West DePere and Green Bay, Wis., April 6. West of the Mississippi the first was reported from Coralville, Iowa, April 19, and Lanesboro, Minn., April 27. Two days later the first came in hundreds to Heron Lake, Minn., when the sun shone in the afternoon after a cold rainy forenoon. The first reached Pine Bend, Minn., May 2, and Frazee City, Minn., May 26. Still farther west migration was earlier than along the central line. At Argusville, Dak., it was seen May 5; and at Oak Point, Manitoba, May 3.

In the spring of 1885 the same warm wave which brought the Martins to the Upper Mississippi Valley induced many White-bellied Swallows to visit Missouri and Illinois. During the last two days of March and the 1st day of April they appeared at Saint Louis, Mo., Paris, Ill., and Fernwood, Ill. April 4 they were seen at Milwaukee, Wis.; April 5 at Green Bay, Wis.; April 7 at Lanesboro, Minn.; April 11 at Minneapolis, Minn., and April 28 at Oak Point, Manitoba. At Saint Louis, Mo., the last one was seen April 29; at Mount Carmel, Mo., May 2; and at Des Moines, Iowa, May 8. Some very late birds were recorded at Bonham, Tex., May 6, and at Gainesville, Tex., May 12.

In the fall of 1885, at Saint Louis, Mo., the first returned September 8; many passed October 5; they were most numerous October 9; and left October 26. They had left Grinnell, Iowa, September 16. Referring to these Swallows, Dr. Coues says: "They breed independently of latitude, some on the highlands of Mexico, and anywhere in the West; but in the East their usual breeding range is said to be north of the parallel of 38°" (Birds of the Colorado Valley, 1878, p. 415).

615. Tachycineta thalassina (Swains.). [156.] *Violet-green Swallow.*

The Violet-green Swallow can hardly claim a place among Mississippi Valley birds. It breeds, however, in western Nebraska, and Dr. Agersborg writes that he has taken it as an accidental visitant in southeastern Dakota. Mr. Lloyd states that it is a fall migrant in Concho County, Tex. Dr. Hatch includes it in his list of Minnesota birds. It winters beyond our borders, and passes northward to British America.

616. Clivicola riparia (Linn.). [157.] *Bank Swallow.*

An abundant summer resident throughout the district, from Manitoba southward. A few spend the winter along our southern border, but the great bulk pass further south—some even to Brazil. In Concho County, Tex., they are a rare fall migrant. They re-enter the United States quite early, but in 1884 none were reported until March 11, on which day they appeared at latitude 31° 52′ and latitude 33° 34′, in Mississippi. The records of the advance were not very regular, as the birds would rarely be seen unless their colonies were visited. About all that can be said from the notes is that during the last week of April they spread over the country from latitude 39° to latitude 44° 30′.

In the spring of 1885 the records of the Bank Swallow were even more irregular than in 1884. The earliest report was from Corinth, Miss., March 31; the latest from Shell River, Manitoba, April 30.

In the fall of 1885 the last left Milwaukee, Wis., August 14. Many were migrating at Saint Louis, Mo., August 12 and August 20. August 24 was a day of great migration at Saint Louis, and the last was seen there September 9.

617. Stelgidopteryx serripennis (Aud.). [158.] *Rough-winged Swallow.*

This swallow breeds over most of the Mississippi Valley, even north to Minnesota, but is most abundant in the Southern States. Few observers, however, are able to distinguish it from the Bank Swallow; hence notes on it are few, and are confined to the notice of its arrival on the same day, April 15, at Saint Louis, Mo., and Manhattan, Kans.; and its appearance the next week at Des Moines, Iowa, and Lanesboro, Minn. At Saint Louis it was sitting on eggs May 16.

In the fall of 1884 the last Rough-winged Swallow was seen at Des Moines, Iowa, August 19.

In the spring of 1885 the first was seen at Manhattan, Kans., April 11, and the next April 22. It arrived at Saint Louis, Mo., April 14; but at Des Moines, Iowa, none were seen till April 24. It reached Lanesboro, Minn., April 21; and Lake City, Minn., April 25. A nest was found at Manhattan, Kans., May 13.

In the fall of 1885 it was last seen at Saint Louis, Mo., September 30.

618. Ampelis garrulus Linn. [150.] *Bohemian Waxwing; Northern Waxwing.*

We must look to the northern observers for notes on this species. From its summer home in British America it wanders south in winter over Manitoba and the Northern States. Any regular study of its migration is difficult because of the irregularity of its movements, which seem to depend in part on the food supply. The most southern locality at which it was seen in the winter of 1883–'84 was Ames, Iowa, where it was noted during November and December. It has been known in previous years to reach Kansas and Illinois, and in the Rocky Mountains has occurred south to latitude 35°. It was seen at Vermillion, Dak., February 26, 1884; at Waukon, Iowa, in January; at Milwaukee, Wis., all through the winter to March 26; at West De Pere, Wis., April 8; and at Red Wing, Minn., the last had not left April 1.

In the spring of 1885 a few records were contributed of the presence of this wanderer in the northern Mississippi Valley. They are as follows: Laporte City, Iowa, January 29; Vermillion, Dak., hundreds of them March 7; Minneapolis, Minn., March 4 and 9; and Elk River, Minn., February 24.

619. Ampelis cedrorum (Vieill.). [151.] *Cedar Bird; Cedar Waxwing.*

The Cedar Bird is an abundant summer resident in Manitoba and over much of the Mississippi Valley. It is another irregular wanderer whose migratory movements can not yet be traced with accuracy. At any particular place in the Mississippi Valley it may or may not winter. Some idea of the irregularity of its movements can be obtained from the records of its appearance in 1884 at different points between the parallels of latitude 40° and 42°. It was first seen at Fayette, Mo., February 2; at Danville, Ill., June 3; at Rockford, Ill., April 18; at Chicago, Ill., March 31. The bulk arrived at Burlington, Iowa, April 20; and the last left Iowa City, Iowa, April 24. Dr. Agersborg saw a flock at Vermillion, Dak., during January, and Mr. Lloyd tells us that the Nueces Cañon in southwestern Texas is the winter home of countless myriads; these two wintering places are over a thousand miles apart. Towards the northern portion of its range the species is not so common, but it goes far north, even to latitude 54°. At Oak Point, Manitoba (lat. 50° 30′ N.) it was first seen May 5. One of the most peculiar characteristics of the species is the late date at which it begins nest building. As if enjoying its Bohemian life, and disinclined to settle down in one place, it loiters around and puts off its house-keeping affairs until the last moment. It does not even mate, but lives in flocks, a happy, careless wanderer, until the hot days of the first half of June warn it that there are other duties to which it must give its attention.

In the fall of 1884 the bulk of Cedar Birds left Williamstown, Iowa, September 15, and the last was seen there September 30. At Des Moines, Iowa, the bulk and last were seen October 25.

In the spring of 1885, after learning that this bird had been common at Elk River, Minn., since January 15, it was discouraging to find its arrival noted a thousand miles farther south in May.

620. Phainopepla nitens (Swains.). [26.] *Phainopepla.*

An inhabitant of the arid region of Mexico, and contiguous portions of the United States, from western Texas to southern California. It has been taken at Eagle Pass, Tex.

621. Lanius borealis Vieill. [148.] *Great Northern Shrike.*

A winter visitant from the north; in Manitoba a spring and fall migrant.

This bird was reported present as usual during the winter of 1883-'84 over all of the northern half of the Mississippi Valley, down to latitude 39°. The last one at Manhattan, Kans., was seen at the rather late date of March 29. At Portage La Prairie, Manitoba, it was said not to have been seen until spring, and the first was recorded April 11, but was heard of two weeks before.

In the fall of 1884 the first Great Northern Shrikes were reported from Des Moines, Iowa, and Emporia, Kans., November 8.

In the spring of 1885 the notes received indicate no regularity in its movements. At Manhattan, Kans., the first and last were reported February 21, and at Grinnell, Iowa, March 31. At Chicago, Ill., the first was seen February 8, and the next, March 13. It arrived at Shell River, Manitoba, March 14.

In the fall of 1885 the first migrant was reported from Milwaukee, Wis., October 31, and from Grinnell, Iowa, October 20.

622. Lanius ludovicianus Linn. [149.] *Loggerhead Shrike.*

The true home of this species is in the southern Atlantic States, from which it pushes west and northwest to a greater or less degree. It is common and resident, according to Mr. Lloyd, at San Angelo, Tex. In the spring of 1884 I shot a true Loggerherd at Caddo, Ind. Ter., where the White-rumped is the common form; and at Saint Louis, Mo., Mr. Widmann gives it as the prevailing form, the White-rump rarely occurring. The full record at Saint Louis is as follows:

> First seen January 31, and again February 2; the bulk did not arrive until March 22, and the next day they began mating. Three nests were found April 11, and on May 31 young birds were flying around, led by their parents, which seemed to have undergone a bleaching process, looking much lighter than two months before."

622a. Lanius ludovicianus excubitorides (Swains.). [149a.] *White-rumped Shrike.*

This is the common Shrike of the Mississippi Valley. It breeds abundantly in western Manitoba, and is resident in the southern part of its range, but retires in winter from the northern portion. At Caddo, Ind. Ter., it is a common summer resident, and many remain through the winter. In western Texas it is an abundant resident. No special migratory movement was observed south of the middle districts. It was recorded as reaching central Iowa March 24, and the vicinity of Minneapolis, Minn., March 31. Mr. S. W. Willard did not find it at West De Pere, Wis., until April 4. The limit of its northern range is in the neighborhood of latitude 54°.

In the spring of 1885 the White-rumped Shrike was seen at Chicago, Ill., March 3; and the same species came to Clinton, Wis., April 4; Grinnell, Iowa, April 5; Lake City, Minn., April 4, and New Richmond, Wis., April 11. Mr. Lloyd says of its habits in western Texas:

> It lives on grasshoppers when it can procure them, and in winter, when the weather is severe, takes to carrion. I found one in January, 1884, so gorged from feeding on a dead sheep that it could not fly. In the Davis Mountains it lives in winter on large coleoptera. In spring it occasionally kills birds. I have seen *Spizella socialis arizonæ, Vireo belli, Polioptila cœrulea,* and others amongst its victims, and in summer it has a fancy for nestlings. It is usually very tame. (The Auk, Vol. IV, 1887, p. 295.)

624. Vireo olivaceus (Linn.). [135.] *Red-eyed Vireo.*

Breeds throughout Manitoba and the Mississippi Valley, after wintering below our southern border, which, in 1884, it crossed late in March, appearing at Gainesville, Tex., April 5. It was recorded from Saint Louis April 26; from latitude 39° 12′, in Kansas, April 30; and latitude 40° 8′, in Illinois, May 1. A week later, May 8, it was noted from latitude 40° 50′, in Iowa. It reached Waukon, Iowa, (lat. 43° 15′) May 18, and the next night several were killed by the electric light at La Crosse, Wis. (lat. 43° 45′). The bulk was noted from latitude 43° 43′, in Minnesota, May 25, after the first had come to latitude 44° 26′, in Wisconsin, May 21.

In the fall of 1884 the bulk of Red-eyed Vireos left Williamstown, Iowa, August 28, and none were seen afterward.

In the spring of 1885 the first was seen at San Angelo, Tex., April 9; at Gainesville, Tex., April 17, and at Manhattan, Kans., April 29. Eastward it came to Saint Louis and Mount Carmel, Mo., April 21, and the next was seen at each of these places April 24. At Paris, Ill., it was reported April 28; Newton, Iowa, May 1; Waukon, Iowa, May 13; Lanesboro, Minn., May 14, and New Richmond, Wis., May 23.

In the fall of 1885 the last was seen at Grinnell, Iowa, September 9. Many were present at Saint Louis, Mo., September 21, and the last was seen there October 10. Mr. Lloyd says it is an abundant summer resident in Tom Green County, Tex.

625. Vireo flavoviridis (Cass.). [136.] *Yellow-green Vireo.*

A bird of Mexico and Central America, coming north to the Lower Rio Grande Valley in Texas, where a single specimen was taken by Dr. Merrill, August 23, 1877.

626. Vireo philadelphicus (Cass.). [138.] *Philadelphia Vireo.*

This is not a common species in the Mississippi Valley, though apparently more common here than in the Eastern States. Little is known of its breeding range. A nest was found near Duck Mountain, Manitoba, June 9, 1884, by Mr. Ernest E. Thompson (Auk, Vol. II, 1885, pp. 305, 306). In 1884 it was noted by two observers only—one at Chicago, May 21, the other at Lanesboro, Minn., May 20. It has not yet been taken in Kansas.

In the spring of 1885 the first Philadelphia Vireo reached Saint Louis May 8. The first record from Des Moines, Iowa, was May 14, and the last was seen there May 20. At Lanesboro, Minn., the first was seen May 18.

In the fall of 1885 the first migrant returned to Saint Louis September 21, and the last was seen there September 27.

627. Vireo gilvus. (Vieill.). [139]. *Warbling Vireo.*

Common in Manitoba and throughout the Mississippi Valley; breeds throughout its range, and winters beyond our southern border. In the spring of 1884 it arrived at Saint Louis April 19, and the bulk came April 29. At this latter date the first came to Manhattan, Kans., followed the next day by the bulk. This day (April 30) also brought the first to Coralville, Iowa, though few were seen until May 3. At Waukon, Iowa, the first was recorded May 10, and the bulk May 18. The first was seen at Lanesboro, Minn., May 18. They had previously been noted (May 3) from Danville, Ill., and (May 11) West De Pere, Wis. At San Angelo, Tex., May 5, 1884, Mr. Lloyd took two males, which pertain to the form then known as *V. swainsoni*, but which is now considered to be not distinct from the eastern *V. gilvus*.

In the fall of 1884 the bulk of Warbling Vireos left Williamstown, Iowa, August 8, and none were seen after that date.

In the spring of 1885, at Saint Louis, Mo., the first was seen April 22, and the bulk of males arrived next day. Their migration north of Saint Louis was not quite so rapid. The first came to Manhattan, Kans., April 27; to Paris, Ill., April 28; Hennepin, Ill., May 1; Waukon, Iowa, May 13; Lanesboro, Minn., May 15, and Heron Lake, Minn., May 19.

In the fall of 1885 none were seen at Saint Louis, Mo., after September 22.

628. Vireo flavifrons Vieill. [140.] *Yellow-throated Vireo.*

In summer this Vireo is dispersed throughout the Mississippi Valley, but it is rare in Manitoba. In winter it is not found north of Florida. In 1884 it must have crossed our border very early, as it appeared at Gainesville, Tex., March 6. Saint Louis was reached April 17. At Manhattan, Kans., where it is rare, it was seen May 3; at La Porte City and Waukon, in Iowa, May 5; and Lanesboro, Minn., May 10. It was first seen at West Depere, Wis., May 7.

In the fall of 1884 the bulk of Yellow-throated Vireos left Williamstown, Iowa, August 11, and none were seen there after that date. At Mount Carmel, Mo., the last was seen September 21.

In the spring of 1885 the first came to Gainesville, Tex., April 6, and they were commom there April 17. At Saint Louis, Mo., they appeared April 20. They were seen at Chicago, Ill., April 21; at Manhattan, Kans., April 22; Mount Carmel, Mo., April 23; Rockford, Ill., May 9; Iowa City, Iowa, May 10; Waukon, Iowa, May 10; and Durand, Wis., May 15.

In the fall of 1885 the last was seen at Grinnell, Iowa, September 10; at Mount Carmel, Mo., September 20; and at Saint Louis, where they were numerous September 26, the last was seen October 12.

629. Vireo solitarius (Wils.). [141.] *Blue-headed Vireo.*

This Vireo winters below our southern border, and breeds principally in Manitoba and the Northern States, occasionally as far south as the 40th parallel, and in a few rare instances still farther south.

In 1884 it was reported from Saint Louis April 29; and from no other station previous to May 10, but on that day it appeared simultaneously at Burlington and Des Moines, Iowa, and at Minneapolis and Elk River, Minn. This same day the last one was seen at Saint Louis, making its stay there only eleven days; so that not only did the van move rapidly, but the species as a whole must be one of the most rapid migrants in the Mississippi Valley.

In 1883, when calculating the average speed of migration for more than a hundred species, it was found that the Solitary Vireo had the highest rate. It seemed to advance all at once, and its rate of speed was estimated at more than 80 miles a day. In 1884 its rate seemed to have been much the same.

In the spring of 1885 the record of the migration of the Solitary Vireo was so irregular that, while its character as a rapid migrant was maintained, no average rate of speed can be calculated from it. The whole record received is as follows: At Mount Carmel, Mo., and La Porte City, Iowa, the first were noted April 26; Paris, Ill., April 28; Saint Louis, Mo., April 30; Waukon, Iowa, May 3; Delaware, Wis., May 7, and Lanesboro, Minn., May 7.

The record of "lasts" was still more irregular. It is as follows: La Porte City, Iowa, April 27; Mount Carmel, Mo., May 3; Des Moines, Iowa, May 8; Saint Louis, Mo., May 13; Waukon, Iowa, May 15.

In the fall of 1885 the first came to Emporia, Kans., September 17, and to Saint Louis, Mo., September 25. None were seen at Des Moines, Iowa, after September 16, nor at Saint Louis, Mo., after October 3.

630. **Vireo atricapillus** Woodh. [142.] *Black-capped Vireo.*

When Coues's Birds of the Colorado Valley was published, in 1878, but four specimens of this Vireo were known, and its easternmost record was western Texas. Mr. Ragsdale has extended its range and brought it fairly within our district by procuring specimens in Bandera County, Tex., where it arrived March 19; and, later, by finding it near the northern boundary of Texas, in Cook County, where he has determined it to be a rare summer visitant. In 1884 he shot but one specimen. At Boerne, Tex., Mr. Brown took it March 27, 1880. At San Angelo, Tex., Mr. Lloyd was more fortunate, securing four of the eight or ten birds which he saw. There, also, it is a summer resident, occurring along the borders of the densest thickets in an unfrequented part of the county. Mr. Lloyd afterwards took several of its nests in Tom Green County. Recently, Colonel Goss has found it breeding plentifully in Comanche County, Kans.

In the fall of 1884 the last male Black-capped Vireo was reported from San Angelo, Tex., September 25; while the last female was seen there September 6.

In the spring of 1885 a pair was seen at San Angelo April 6, and they had become common there by April 9. At Gainesville, Tex., the first was seen April 17.

In the fall of 1885 they were leaving San Angelo September 16.

631. **Vireo noveboracensis** (Gmel.). [143.] *White-eyed Vireo.*

Breeds throughout most of the Mississippi Valley, south of Minnesota, occasionally reaching westward to the eastern foot-hills of the Rocky Mountains.

In Kansas it is a common summer resident. In the valley of the Lower Rio Grande, in Texas, it is a permanent resident (Merrill). The winter home of this species extends from the Southern States southward. In the spring of 1884 its northward migration began the latter part of March, and it arrived at Gainesville, Tex., just beyond its winter home, March 24. The next day three were shot and two were heard at Caddo, Ind. Ter. It was reported at Saint Louis, April 17; at Danville, Ill., April 27; at Iowa City, Iowa, April 30; and on May 26, probably many days after it had arrived in that latitude, it was seen at Heron Lake, Minn., which is near its northern limit.

In the spring of 1885 the first White-eyed Vireo appeared at Gainesville, Tex., March 23; at Corinth, Miss., April 7; and at Saint Louis, Mo., and Grinnell, Iowa, April 20. At Paris, Ill., the first was not seen until April 28, and at Pierce City, Mo., not until May 8. It became common at Gainesville, March 31; at Corinth, April 15; and at Saint Louis, April 23.

Mr. Lloyd says it is a fall migrant in western Texas.

In the fall of 1885 the last was seen at Grinnell, Iowa, September 28 At Saint Louis the bulk was present September 25; the bulk departed September 29, and the last was seen October 14.

632a. **Vireo huttoni stephensi** Brewst. [——.] *Stephen's Vireo.*

The known habitat of this western subspecies is in Arizona, western Mexico, and Lower California. Its presence in our district has been ascertained by Mr. Lloyd, who took half a dozen specimens at Fort Davis, Tex., where it was rare in the winter of 1885–'86. The specimens were identified by Mr. Ridgway.

633. **Vireo belli**; Aud. [145.] *Bell's Vireo.*

Though a bird of the western United States, Bell's Vireo comes eastward far enough to invade much of the Mississippi Valley. It has been found breeding in Illinois, and extends north to Minnesota and Dakota. From Kansas to southeastern Texas it is an abundant summer resident. Its winter home appears to be in the Southwest, and the birds which spend the summer in the region along the Mississippi probably reach it by a northeast and eastward migration. It was found in central and northern Texas during the middle of April, and was reported as very common at San Angelo, Tex. The last of April and the 1st of May it was reported from southern and east-central Missouri, and the middle of May from central Iowa. By May 11 it had arrived at Saint Louis in full numbers and was at its breeding places. At the same time the bulk arrived at Manhattan, Kans., where the first was seen April 27. At this point it is very abundant, being the characteristic summer Vireo, and many nests are taken annually. At San Angelo, Tex., the species breeds from May 1 to July 3, and Mr. Lloyd has taken clutches of five, six, seven, and two of eight eggs each.

In the fall of 1884 the last Bell's Vireo was seen at Mount Carmel, Mo., August 27.

In the spring of 1885 Bell's Vireo was one of the few species the record of whose migration in Texas was regular. It was seen at San Antonio, April 7; San Angelo, April 16; and Gainesville, April 23. It reached Manhattan, Kans., and Paris, Ill., April 28, and Saint Louis, Mo., April 29. At Hennepin, Ill., one was seen May 3; and at Grinnell, Iowa, May 14. The bulk arrived at Saint Louis May 3.

In the fall of 1885 the dates of departure of this species from Grinnell, Iowa, Mount Carmel, Mo., and Saint Louis, Mo., fell within the five days from August 27 to September 1.

634. **Vireo vicinior** Coues. [147.] *Gray Vireo.*

The home of this Vireo is in western Texas, and thence westward to southern California.

636. **Mniotilta varia** (Linn.). [74.] *Black and White Creeper.*

With this species we take up a group of strictly migratory birds, the greater number of which migrate so late that their tiny forms can hardly be seen amid the thick foliage. Moreover, the number of different species is so great, and the variations of plumage so endless, that the young student of ornithology is bewildered, and for the first year is compelled to leave the subject with the single note, "great numbers of Warblers came last night, and to-day the woods are full of them." The Black and White Creeper is one of the best known of these Warblers, and one of the few which breed throughout the whole Mississippi Valley and Manitoba.

Forsaking this district in winter, it returns late in February or early in March. In the spring of 1884 they arrived at both Manhattan, Kans., and Saint Louis, Mo., April 17—a thing which seldom happens, as Western birds are usually later than Eastern. After a pause of a few days, they advanced rapidly on April 27 and April 28 to latitude 42°. May 1 found them at latitude 44°, and May 10 at latitude 47° 30′. The bulk followed some ten or twelve days in the rear. This species has not yet been traced west to the Rocky Mountains, but it has been found in Texas as far west as San Angelo, and it was seen April 9 at Gainesville, Tex.

In the fall of 1884 the bulk of Black and White Creepers left Williamstown, Iowa, August 22, and the last September 5. The bulk left Mount Carmel, Mo., August 25, and the last September 11. At San Angelo, Tex., the last was seen September 23.

In the spring of 1885 the notes on the Black and White Creeper indicate that it moved earlier in the western part of the district than in he eastern, or else that it was confounded with some other bird. The first was recorded at Gainesville, Tex., March 31, and the remark was made that this date was ten days later than the earliest record of previous years. It was reported from Corinth, Miss., April 7. The next note came from Manhattan, Kans., where it was reported April 15. At Mount Carmel, Mo., it was seen April 18. During the three days from April 21 to April 23 it was seen at Saint Louis, Mo.; Paris, Ill.; Chicago, Ill.; Fernwood, Ill.; Des Moines, Iowa; Waukon, Iowa, and Lanesboro, Minn. At Chicago they were marked common April 21. After a long pause they advanced to Ripon, Wis., May 5, and were noted from New Richmond, Wis., May 10. One was seen at White Earth, Minn., May 16.

In the fall of 1885 the last was seen at Saint Louis, Mo., September 25. It disappeared from River Falls, Wis., September 15. The first appeared at San Angelo, Tex., September 3.

637. Protonotaria citrea (Bodd.). [75.] *Prothonotary Warbler.*

Winters beyond our southern border, and advances in spring regularly to southern Indiana, Illinois, Iowa, and Nebraska, and occasionally a little farther, breeding throughout its United States range.

August 16, 1874, Dr. Hvoslef shot a Prothonotary Warbler in western Wisconsin, opposite the mouth of the Root River. The most northern record of its occurrence is that of F. L. Grundtvig, who procured a handsome male at Shiocton, Outagamie County, Wis., May 4, 1882.* In eastern Kansas it is a common summer resident (Goss).

Its earliest record in the spring of 1884 came from Rodney, Miss., where it was first seen April 13. Five days later it was reported from Saint Louis. Hence it is probable that it really reached Rodney several days previous to the 13th. It was seen at Burlington, Iowa, May 3; north of that no dates of arrival were recorded. At Manhattan, Kans., near the limit of its western range, it was much later in its movement, not being seen until May 14. Nor was it reported from Gainesville, Tex., until May 12, though of course it arrived much earlier.

The Prothonotary Warbler was found as an abundant summer resident at Red Rock, Ind. Ter., in 1884.

In the spring of 1885, Gainesville, Tex., was the first station to report its presence. It arrived there April 17. Three days later it appeared at Saint Louis, Mo., and April 21 it was seen at Paris, Ill. The bulk reached Saint Louis April 29.

In the fall of 1885 the last was seen at Bonham, Tex., August 10.

638. **Helinaia swainsonii** Aud. [76.] *Swainson's Warbler.*

A Southern species, until recently one of the rarest of North American birds. It has been taken in South Carolina, Georgia, Florida, Louisiana, and Texas, and winters in Cuba and Jamaica. In the spring of 1886 "about three dozen" Swainson's Warblers were shot near Lake Pontchartrain, Louisiana, by Mr. Charles S. Galbraith (Lawrence, The Auk, Vol. IV, 1887, p. 37). In the spring of 1887 nine additional specimens were secured in the same locality (*Ibid.*, p. 63). Mr. C. W. Beckham considers the bird a common summer resident at Bayou Sara, La. (*Ibid.*, pp. 304, 305). The only Texas record is that of a specimen killed in Navarro County, in the east-central part of the State, by Mr. J. Douglas Ogilby, and recorded by Mr. Ridgway (Bull. Nutt. Ornith. Club, Vol. VI, 1881, pp. 54, 55).

639. **Helmitherus vermivorus** (Gmel.). [77.] *Worm-eating Warbler.*

Winters south of our district and breeds throughout its United States range, which extends in summer to Illinois and Nebraska. Rare in Kansas (Goss) and in southeastern Texas (Nehrling).

The only note on this species contributed in the spring of 1884 is to the effect that the first was seen at Saint Louis April, 29.

In the spring of 1885 the Worm-eating Warbler first appeared at Pierce City, Mo., May 9, and at Saint Louis, May 4. At Mount Carmel, Mo., the first was reported May 20, and at Paris, Ill., May 3. At Mount Carmel the last was seen May 24.

640. **Helminthophila bachmani** (Aud.). [78.] *Bachman's Warbler.*

This rare and much-sought-after Warbler occurs in the South Atlantic and Gulf States from South Carolina to Louisiana. In winter it has been found in western Cuba. Until very recently (the spring of 1886) more than half a century had elapsed since the publication of any positive record of its capture in the United States. In the spring of 1886 a single specimen was shot at Lake Pontchartrain, Louisiana, by Charles S. Galbraith, a collector of birds for millinery purposes. Fortunately it was given to the veteran ornithologist Mr. George N. Lawrence, who promptly recorded the fact in the Auk (Auk, Vol. IV, 1887, pp. 35–37.) This was followed by a notice of a specimen which killed itself against the light-house at Sombrero Key, Florida, March 21, 1887 (Merriam, *Ibid.*, p. 262), and by a second article by Mr. Lawrence, recording the capture of six additional specimens at Lake Pontchartrain by Mr. Galbraith. All were killed in the spring of 1887, but the only exact date given is March 29, when one of the males was shot (*Ibid.*, pp. 262–263.) In March, 1888, Mr. Galbraith collected thirty-two specimens on the borders of Lake Pontchartain, La. He considers them migrants and not summer residents, as no specimens were seen after the latter part of March, although they were diligently sought for up to the middle of April (*Ibid.*, Vol. V, p. 323.)

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* Bull. Nutt. Ornith. Club, vol. viii, April, 1883, p. 68.

641. **Helminthophila pinus** (Linn.). [79.] *Blue-winged Yellow Warbler.*

A tolerably common summer resident over most of the Mississippi Valley except the extreme northern portion. When this beautiful Warbler entered the United States in 1884 and 1885, or how fast it journeyed northward, the record does not tell. All the notes came from the middle district where it is nearly at the limit of its northward range. It is not yet known from northern Illinois, and the most northern record in that state in 1884 was from Carlinville, where it arrived April 30. West of the Mississippi, its northward extension is greater. The first reached Saint Louis, Mo., April 24; the bulk April 30; and migrating individuals were still passing May 5. It reached latitude 42° May 3. North of this there was no record in 1884, but the species is not uncommon in southern Minnesota. The most western record came from Ellis, Kans.

In the fall of 1884 the Blue-winged Yellow Warbler was last seen at Des Moines, Iowa, August 29.

In the spring of 1885 no records were received of its movements until it reached Saint Louis, Mo., April 21. Two days later it was seen at Mount Carmel, Mo. It arrived at Emporia, Kans., April 28, and at Peoria, Ill., April 29. It was seen at Des Moines, Iowa, May 4; at Iowa City, Iowa, May 8. Two records were received of its appearance May 7 at points near the extreme northern limit of its range. Dr. Hvoslef secured it for the first time at Lanesboro, Minn., and a few miles farther east, at La Crosse, Wis., Mr. C. H. Stoddard obtained a specimen. This is the first Wisconsin record from any of the observers.

642. **Helminthophila chrysoptera** (Linn.). [81.] *Golden-winged Warbler.*

This handsome Warbler breeds in Minnesota, Wisconsin, and Michigan. The record of its northward migration in 1884 began at latitude

37° April 25, and ended at latitude 45° May 14. Dr. Coues says it breeds throughout its United States range, but Mr. Ridgway says it does not breed in southern Illinois, and Mr. Widmann noted the last at Saint Louis, May 11. In southeastern Texas it is common during the migrations (Nehrling.) Its dispersion in the west is limited. It has been found a few times in Nebraska, but it is "not yet authentic as a bird of Kansas."

In the fall of 1884 the Golden-winged Warbler was last seen at Mount Carmel, Mo., August 24.

In the spring of 1885 the record at Saint Louis was as follows: First, April 28; bulk arrived May 4; bulk departed May 14; and last, May 22. At Iowa City, Iowa, the first was reported May 17; at Fernwood, Ill., May 18; at Chicago, Ill., May 9; and Durand, Wis., May 17. Dr. P. R. Hoy has taken two nests at Racine, Wis.

645. Helminthophila ruficapilla (Wils.). [85.] *Nashville Warbler.*

Although more properly a bird of the east, this Warbler is found in migration throughout the Mississippi Valley. It breeds from northern Illinois and Nebraska northward, but is rare in Manitoba. In winter it is not found within our borders. The earliest record in the spring of 1884 came from Gainesville, Tex., where the first arrival was noted March 19. This was followed by a long interval without a record, and the next note came from Saint Louis, the first male arriving there April 29. The rest of the Saint Louis record is that the bulk arrived from April 30 to May 3; bulk left May 12, and the last was seen May 17. Before this, on May 8, it had advanced to latitude 43° 15′ in Iowa; and May 10 to latitude 44° 26′ in Wisconsin. Many were seen at Lanesboro, Minn., May 13.

In the spring of 1885, as in 1884, the earliest record of the migration of the Nashville Warbler came from Gainesville, Tex., where the first was seen April 18. This is almost a month later than its arrival at the same place in 1884. At Saint Louis, Mo., the first was seen April 20, and the bulk arrived there April 30. On May 6 and 7, Nashville Warblers were seen at Lanesboro, Minn., Durand, Wis., and River Falls, Wis. The bulk left Saint Louis May 14, and the last May 22. None were noted at Waukon, Iowa, after May 19.

In the fall of 1885 the Nashville Warbler was one of several species of Warblers which appeared very early at San Angelo, Tex. Both this and the Canadian Flycatching Warbler were seen there before they appeared at Saint Louis, Mo., more than five hundred miles to the northeastward. Unless these instances are purely accidental, they would indicate a breeding range in the Rocky Mountains much farther south than its breeding range near the Mississippi River. The first was shot at San Angelo, Tex., September 13, but it was not seen at Saint Louis till September 17. Many birds in high plumage were present at Saint Louis, September 22, and the species continued in great numbers until October 10, when it suddenly disappeared. The last was seen October

12. At Emporia, Kans., the first was noticed October 6, and at Gainesville, Tex., October 11.

645 a. Helminthophila ruficapilla gutturalis Ridgw. [85, part.] *Calaveras Warbler.*

The western United States, from the Rocky Mountains to the Pacific, is the habitat assigned to this sub-species by the A. O. U. Check List. Its known range has been extended lately by Mr. William Lloyd, who took it in Concho County, Tex., where it is an abundant fall migrant. The specimens were identified by Mr. Ridgway.

646. Helminthophila celata. (Say). [86.] *Orange-crowned Warbler.*

The Orange-crowned Warbler breeds north of the United States and winters in the South Atlantic and Gulf States and in eastern Mexico. It is not a very noticeable Warbler, but seems to occur abundantly at several points in our district. It has been found occasionally in large numbers in northwestern Minnesota and Manitoba. Recently Mr. Lloyd has reported it as an abundant fall migrant in western Texas, and Colonel Goss says it is a common migrant in Kansas. Mr. Brown found it the most abundant Warbler in spring migration at Boerne, Tex. In the valley of the lower Rio Grande in Texas it is rather common during the colder months (Merrill). In the spring of 1884 it arrived at latitude 37° April 19, and was still present May 1. All the dates given for the country between latitude 39° and latitude 44° were in the few days from May 8 to 12. It would seem then that the species, after pausing or proceeding slowly, accelerated its pace on those four days, which were great days for movements among Warblers all over the Mississippi Valley.

In the spring of 1885 the records of the migration of the Orange-crowned Warbler were very regular. It first appeared at San Angelo, Tex., April 2; at Gainesville, Tex., April 17; Saint Louis, Mo., April 22; Emporia, Kans., April 25; Paris, Ill., May 3; Des Moines, Iowa, May 2; Lanesboro, Minn., May 4; New Richmond, Wis., May 13. None were seen at Des Moines, Iowa, after May 12, nor at Lanesboro, Minn., later than May 25.

The breeding range of the Orange-crowned Warbler extends much farther south in the West than in the Mississippi Valley. Hence it is not surprising that in fall migration it appears at San Angelo, Tex., nearly three weeks before it reaches Saint Louis.

In the fall of 1885 the arrival of the first at San Angelo, Tex., was noted September 4; while at Saint Louis, Mo., the first came September 21. The species was abundant at Saint Louis, October 10, and the bulk was still present October 17. At Lanesboro, Minn., the last was seen October 2.

At Warrensburg, in western Missouri, it is an abundant spring migrant, being common from the latter part of April till the middle of May (Scott, Bull. Nutt. Ornith. Club, Vol. IV, 1879, p. 141).

647. Helminthophila peregrina (Wils.). [87.] *Tennessee Warbler.*

From its winter home beyond our borders, the Tennessee Warbler enters the United States early in April. It breeds from Minnesota northward. In Kansas it is a common migrant (Goss). In the spring of 1884 it had reached Saint Louis, Mo., April 29, and other notes, though few, indicate pretty regular progress northward. Burlington, Iowa, was reached May 11; Lanesboro and Heron Lake, Minn., May 13 and May 16; and West Depere, Wis., May 21. At Saint Louis the bulk came May 5, and left May 13, just as the first reached Lanesboro, Minn. May 18 it was the most common bird of the day at Lanesboro, and three days later the last one left Saint Louis, so that on May 21 the whole of the species, according to the record, was included between latitude 38° 40′ and latitude 44° 26′.

In the spring of 1885 no record was received of its movements until the first reached Saint Louis April 28. The bulk arrived there April 30. At Paris, Ill., the first was seen May 3; at Chicago, May 9; at Delavan, Wis., May 2; at Lanesboro, Minn., May 7, and at White Earth, Minn., May 16. The bulk left Saint Louis, Mo., May 16, and the last was seen there May 22. At Lanesboro the last was noted May 26.

In the fall of 1885 the only station contributing a record of the Tennessee Warbler was Saint Louis, Mo., where the first arrived September 21. It was numerous by September 26, and increased in abundance till October 6, when it was heard and seen everywhere. These great numbers continued until October 12. The bulk left October 17, and the last followed October 20. Mr. Lloyd states that in Tom Green County, Tex., it is an early fall migrant, and is tolerably common; and Mr. Nehrling says it is not uncommon during migration in southeastern Texas.

648. Compsothlypis americana (Linn.). [88.] *Blue Yellow-backed Warbler; Parula Warbler.*

The large majority of Parula Warblers go to the Northern States and British America to breed, but a few have been detected rearing their young in various parts of Nebraska and Illinois, and Mr. Nehrling has found them in the breeding season as far south as Pierce City, Mo., and also in southeastern Texas, near Houston. Colonel Goss thinks they breed in eastern Kansas, where they are a common migrant, and they have been seen during the whole of the summer in northern Mississippi. Dr. Fisher found them quite common in the vicinity of Lake Pontchartrain, La., in the summer of 1885. They winter just beyond the southern border of the United States. In the spring of 1884 they started northward early in March, reaching Caddo, Ind. Ter., March 25. They were recorded at Saint Louis, Mo., April 14, and at West Depere, Wis., May 10. The bulk followed closely, not more than three or four days later than the van, so that from the dates of first arrival the movements of the bulk may be predicted.

In the spring of 1885 the first Blue Yellow-backed Warblers were noted as follows: Houma, La., March 28; Gainesville, Tex., April 17; Saint Louis, Mo., April 17; Chicago, Ill., May 9, and Milwaukee, Wis., May 5. It became common at Houma April 7, and at Saint Louis April 21.

In the fall of 1885 it was last seen at Saint Louis October 6.

649. **Compsothlypis nigrilora** (Coues). [89a.] *Sennett's Warbler.*

This warbler is known only from the Lower Rio Grande Valley in Texas, where it is a common summer resident (Sennett; Merrill). In the vicinity of Fort Brown it arrives about the third week in March (Merrill).

650. **Dendroica tigrina** (Gmel.). [90.] *Cape May Warbler.*

The Cape May Warbler winters south of our border and crosses the United States in its migrations to its northern breeding grounds. A few years ago the region east of the Mississippi was regarded as its home, and any record west of it was considered as accidental; but since more than two-thirds of the notes for 1884 came from the western side, the question arises whether the species may not be moving westward. Throughout most of the east it is rather rare, but in east-central Wisconsin it has been found in great numbers, "hundreds seen in a day"; * in Minnesota it is stated to be very common in migration, and in western Manitoba it is not rare. The most southwestern of the records is that from Pierce City, Mo., where it was found April 27, 1884. It reached latitude 42° 06′ May 5; was taken at West Depere, Wis., May 11, and by May 23 had arrived at Elk River, Minn. A female was taken at Lanesboro, Minn., May 21. It was also taken in Iowa, but the most interesting record is of its occurrence in Nebraska. Mr. Powell writes that at Alda, Nebr., May 12, 1883, he took an old male in good plumage, and a few days later three birds, probably of this species, were seen.

In the spring of 1885 the few notes received on the movements of the Cape May Warbler indicate that its migration was very regular. "Firsts" were reported as follows: Saint Louis, Mo., May 12; Delavan, Wis., May 14; Lanesboro, Minn., May 18; and Elk River, Minn., May 20. A sudden cold snap stopped their migration and they took refuge, May 18, in the heavy timber near Lanesboro, Minn. Throughout the day they were exceedingly numerous. The next day not one was found. In the fall of 1885 they first appeared at Saint Louis, September 9.

651. **Dendroica olivacea** (Giraud). [92.] *Olive Warbler.*

Inhabits the highlands of Mexico and Guatemala, coming north to Texas (Giraud) and Arizona.

652. **Dendroica æstiva** (Gmel.). [93.] *Yellow Warbler.*

After wintering below our southern border this species passes in summer over the whole of the United States and Manitoba, breeding throughout its range. Mr. William Lloyd says that in Tom Green and Concho Counties, Tex., it is more abundant in spring and fall than all the other warblers together. In the spring of 1884 it crossed our border late in March, or early in April, appearing at San Angelo, Tex., April 10. As usual, the migration eastward was considerably in advance of that in the west, and the species was seen at Saint Louis April 19; but at latitude 39° 12′ in Kansas not until April 25. East of Saint Louis the time of arrival was fully as early as at Saint Louis, since Mr. Balmer found the first at Danville, Ill., April 21. May 5 to May 8 seems to have been the period of greatest activity with this species, notes coming these days from northern Illinois, Wisconsin up to latitude 44° 26′ and latitude 44° 30′, the whole of Iowa, the southern edge of Minnesota at 43° 43′, and north to latitude 42° 56′ in Dakota. Its migration certainly did not become slower in the north, for the first was seen May 10 at latitude 45° 25′ in Minnesota, May 11 at latitude 46° 33′ in Minnesota, May 13 at latitude 44° 21′ in Dakota, and May 18 at Portage la Prairie, Manitoba (latitude 50°).

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* Gruntvig, Bull. Nutt. Ornith. Club, Vol. VIII, 1883, pp. 67, 70.

The bulk moved about six or seven days behind the van.

In the fall of 1884 the bulk of Golden Warblers left Williamstown, Iowa, August 1, and the last August 10. At Des Moines, Iowa, the last was reported August 29, and at Mount Carmel, Mo., August 7. The following note was received from Mr. Wm. Lloyd, of San Angelo, Tex.:

> A peculiar flight of Golden Warblers should be mentioned, which occurred here August 15. After being few and far between since May, on the above date they appeared by hundreds all over the country, ranging as far as four miles from water, to the outer limits of the range of the Cañon Finch. I noted in their company on the river the Black-capped Fly-catching Warbler, and the Black and White Creeping Warbler. A similar occurrence took place last year (1883), though about a week earlier. I find recorded in my notes the sudden abundance of the Golden Warbler, about August 10, at a place some sixty miles from here. Already (September 3) they are far less abundant. I hardly know whether to consider that these are early migrants resting on their way south, or just a chance visitation caused by the food supply failing in some other neighborhood.*

It is strange how persistently the Yellow Warbler is confounded with the American Goldfinch by our observers. Fully 10 per cent. of the notes sent in under the name "Yellow Warbler," "Summer Yellow Bird," etc., were found by comparison of dates to belong to the other species. This bird crossed our southern border early in April, appearing at Houma, La., and Bonham, Tex., April 9. At each of these places the species was next seen April 11. At Saint Louis, Mo., the first was seen April 18, after a very unfavorable night for migration. Four days later (April 22) an increase was observed, and April 24 the bulk of males came. The same day they were noted from Mount Carmel, Mo,, and Paris, Ill. The southern edge of Iowa was reached April 25, and latitude 41° in Iowa and Illinois April 29. They arrived at Chicago, Ill., May 9, three days after they had reached points on the Mississippi River, a hundred miles farther north. The last part of the migration seems to have been more rapid than the first. The birds were so delayed by the cold of the early part of May that on May 11 there had been no record of arrival at any point north of latitude 44°, yet by May 16 they had been seen over the rest of Wisconsin, all of Minnesota, central Dakota, and at two stations in Manitoba, up to latitude 50° 30′. More than two hundred were seen at White Earth, Minn., May 16.

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*[Beyond a doubt they were regular migrants.—C. H. M.]

In the fall of 1885 the last left Saint Louis, Mo., August 13, and Bonham, Tex., September 3; and the first migrant reached San Angelo, Tex., August 28.

654. Dendroica cærulescens (Gmel.). [94.] *Black-throated Blue Warbler.*

The movements of this species may be summed up in a few words: It winters from Florida southward, extends west to Texas, Indian Territory, Kansas, and Nebraska, and breeds principally in British America, though a few doubtless nest in northern Minnesota. It reached latitude 40° May 1, latitude 42° May 6, latitude 44° May 10, and was seen at Elk River, Minn., May 23, but probably arrived there a few days earlier. This is one of the birds that is unaccountably rare at Saint Louis, while it is abundant in the surrounding country. At Pierce City, Mo., May 2, it was, next to the Yellow-rump, the most common Warbler.

In the spring of 1885 the first Black-throated Blue Warbler was seen at Saint Louis April 30; at Paris, Ill., May 1; at Milwaukee, Wis., May 5; at Waukon, Iowa, May 14; and at Hastings, Minn., May 19.

In the fall of 1885 it was first seen at Lanesboro, Minn., September 30. At Fernwood, Ill., the first was seen September 6; the bulk left October 11, and the last October 14. An albino was taken at Fernwood during fall migration.

655. Dendroica coronata (Linn.). [95.] *Yellow-rumped Warbler.*

Breeds from northern Minnesota northward, and winters from the middle portion of the Mississippi Valley southward. Dr. J. C. Merrill states that in the Lower Rio Grande Valley in Texas the Yellow-rump "is perhaps the most common of the winter residents, and is found in the greatest abundance from the latter part of October to April. About the latter part of March there is an arrival of males from the south in nearly full breeding plumage." The species winters over an immense area. While it is abundant in southern Texas, and great numbers pass on through Mexico to Central America, as far, even, as Panama, still it is the hardiest of our Warblers, and unnumbered thousands regularly pass the winter in the lower half of the Mississippi Valley. It has been known to endure a temperature of 20° below zero with no apparent inconvenience. With plenty of poison ivy berries to eat, it seems not to care how the mercury stands. Along latitude 39° it generally winters almost everywhere, but the unusually severe weather of the first week in January, in 1884, drove it southward from all but the most favorable localities. About twenty birds remained through January at Saint Louis, and not quite so many at Manhattan, Kans. It was not until the middle of March that the northward movement commenced. This was marked at Caddo, Ind. Ter., by the return of the birds from the bottom lands, whither they had been driven by the cold, to the edges of the prairie. There was scarcely any increase in numbers until April 1. At more northern localities the first wave was marked by the arrival of more birds. This wave reached latitude 39° the last week of March, but was stopped by the heavy snow-storms of the first week in April and made no further advance until the middle of the month. Out of the nineteen records of arrival at stations between latitude 39° and latitude 45° but two mentioned any Yellow-rumps before April 16. But on that and the two following days they appeared in large numbers over the whole of these 200,000 square miles. What an incredible number of Yellow-rumps must have been moving on those three days! The same wave brought the bulk to the region south of latitude 39°, and another two weeks carried it up to latitude 45°, making the species, for the time being, one of the most numerous birds of the Upper Mississippi Valley. Having now passed over the land of spring-time and reached a country still ruled by winter, they checked the hurriedness of their flight and did not reach Portage La Prairie, Manitoba, until the first week in May. A few breed in northern Minnesota, but the bulk pass on to breed in British America. A curious incident occurred in the migration of this species at Heron Lake, in southwestern Minnesota. On March 18 there arrived an immense flight of Ducks, all coming from the west as if from the Missouri Valley. Together with them, or at least on the same day, came great flocks of Blackbirds and "a large flight of Yellow-rumps in fine feather and song." Where they came from is a mystery. A competent observer on the Missouri River southwest of Heron Lake did not find the species common until nearly two months later, and no station south or southeast reported them at all until three weeks later, nor at Heron Lake was the arrival of the bulk noted until thirty-three days afterwards. It would seem to be a case of a flock caught up by some upper-air current and carried farther than they intended. While most of the birds left central Illinois the first week in May, some very late migrants were seen at Whitehall May 21.

In the fall of 1884 the first note of the Yellow-rumped Warbler came from the edge of its breeding-grounds at Elk River, Minn., where the bulk arrived September 9; the bulk left October 8, and the last November 5. The first was noted from Des Moines, Iowa, October 18; the bulk October 21, and the last October 25. At Mount Carmel, Mo., the first was reported September 27; departure of bulk October 22, and last seen November 3. During the winter of 1884–'85 no reports were received of irregular wintering of the Yellow-rumps, except from Manhattan, Kans., where four birds were seen January 24. No more were seen there for three months.

In the spring of 1885 the first migrant was noted at San Antonio, Tex., February 27; at Gainesville, Tex., March 23, and at Saint Louis, Mo., April 8. The remaining notes are too irregular to be systematized. April 16 the bulk reached Saint Louis; April 18 the first came in large numbers to Newton, Iowa, and Lanesboro, Minn. April 3 they appeared at Minneapolis, Minn., and Elk River, Minn., while they did not reach Shell River, Manitoba, till the last day of the month. At Bonham, Tex., the last was seen April 15; at Houma, La., April 20; Pierce City, Mo., May 6; Saint Louis, Mo., May 12; Manhattan, Kans., May 16. Except a single record from Waukon, Iowa, May 19, none were reported from Iowa, Minnesota, or Wisconsin after May 16, and most of the Yellow rumps left these States May 11.

In the fall of 1885 the Yellow-rumped Warbler re-appeared at Elk River, Minn., September 20; at River Falls, Wis., September 29; Lanesboro, Minn., September 29; Iowa City, Iowa, October 1; Fernwood, Ill., October 5; Mount Carmel, Mo., October 4; Saint Louis, Mo., October 5, and Gainesville, Tex., November 13. Thus its record west of the Mississippi River was very regular. The last were seen at Elk River, Minn., October 7; River Falls, Wis., October 13; Lanesboro, Minn., October 18; Iowa City, Iowa, October 12; Fernwood, Ill., October 14; Des Moines, Iowa, October 24; Mount Carmel, Mo., November 11, and on the latter date the last transients were seen at Saint Louis. Their period of greatest abundance at Saint Louis was from October 9 to October 26. Mr. Lloyd gives it as a spring migrant in Tom Green and Concho Counties, Tex., while in southeastern Texas it is an abundant winter resident (Nehrling), as it is at Boerne (Brown).

656. Dendroica auduboni (Towns.). [96.] *Audubon's Warbler.*

This Warbler, which is the western representative of the Yellowrump, migrates along the western border of the district from its winter home in Mexico and southward. Colonel Goss, in his Catalogue of the Birds of Kansas, mentions it as a not uncommon migrant in the western part of that State. In the spring of 1884 it was taken at San Angelo, Tex., May 3. Mr. Lloyd states that it is a tolerably common spring and fall migrant in Tom Green and Concho Counties, Tex., where he has killed it as late as October 20 (1886).

In the spring of 1885 San Angelo, Tex., was the only station that reported the migration of Audubon's Warbler. It was first noticed May 3.

In the fall of 1885 it appeared at San Angelo, October 1. Mr. Lloyd found this species common, November 3, at Fort Davis, Tex.

657. Dendroica maculosa (Gmel.). [97.] *Magnolia Warbler; Black and Yellow Warbler.*

This Warbler may breed in northern Minnesota, but no nests have been found, and the bulk crosses the line. It is a rapid migrant. Rushing up the Mississippi Valley in the spring of 1884, from its winter home far south of our border, it appeared at Pierce City, Mo., May 2, and at Elk River, Minn., May 21. This gives an average of thirty-two miles a day. In 1883 its average rate over nearly the same ground was thirty-five miles a day. Mr. Widmann's report from Saint Louis is as follows: "May 5, first, one old male, silent; May 7, bulk of males in song, and first female; May 10, in pairs; May 11, last male; May 17, last female." Thus the entire time occupied by this species in passing Saint Louis was less than two weeks, while the stay of the Yellow-rumped Warbler at the same station was about seven weeks (March 23 to May 10).

In the fall of 1884 the last Black and Yellow Warbler was reported from Des Moines, Iowa, August 26.

In the spring of 1885 no records of its movements were received from the country south of Saint Louis, Mo., at which place the first came May 4. On the same date it was seen at Peoria, Ill., and the next day (May 5) at Iowa City, Iowa, Chicago, Ill., and Milwaukee, Wis. At Lanesboro, Minn., the first was seen May 10; at Heron Lake, Minn., May 14; at Durand, Wis., May 15; and at New Richmond, Wis., May 18. At Saint Louis the bulk was present May 5 to May 14, and both at Saint Louis and at Des Moines, Iowa, the last was seen May 22. This is later than the dates noted at any of the more northern stations.

In the fall of 1885 several appeared at Saint Louis, Mo., September 17, but all left in the course of the next ten days.

In Kansas it is a rare migrant (Goss).

658. **Dendroica cærulea** (Wils.). [98.] *Cerulean Warbler.*

Little can be said of this Warbler. Though not uncommon in the Mississippi Valley, its habit of keeping in the tops of the tallest trees enables it to pass unnoticed. It leaves the United States in the fall, and in summer is found from the Gulf to Minnesota and west to eastern Kansas and Nebraska. In the spring of 1884 the first arrived at Saint Louis April 14, and the bulk April 26. It was also seen at Burlington, Iowa, May 11, and there the record ends.

In the spring of 1885 the record of the Cerulean Warbler at Saint Louis was as follows:

April 17 the first was seen; April 17 the bulk of the males arrived at the stands; April 24–27 the bulk of the females arrived, and mating began.

At Hennepin, Ill., the first was seen April 20, and at New Richmond, Wis., May 25. During the middle of October, 1885, Mr. Lloyd met with it in small flocks ("of five to eight") in western Texas.

659. **Dendroica pensylvanica** (Linn.). [99.] *Chestnut-sided Warbler.*

Breeds throughout Manitoba and the Northern States, south to Iowa and northern and central Illinois. This is another of the well-known Warblers, but it was not noted by any of the southern observers. In the spring of 1884 it was not recorded until May 1, when latitude 39° was reached. The 43d parallel was crossed May 10, and latitude 45° 30′ May 18. So rare is it in the West that it has been taken but twice in

Kansas; although seen quite often in Nebraska, it is not known to nest there. Its stay at Saint Louis was unusually short, lasting only from May 6 to May 15, while in 1883 it arrived April 27 and left May 24.

In the spring of 1885 the Chestnut-sided Warbler was one of the few species seen at Mount Carmel, Mo., before its arrival was noted at Saint Louis. Although Mount Carmel is only a few miles north of Saint Louis, and not many miles west, yet comparison of an extensive series of notes from the two places shows that the arrival of birds at Mount Carmel averages several days later than at Saint Louis. The cause of this is not difficult to determine. The Mississippi River is the great highway of travel for the birds as they come from the south, but when they reach Saint Louis the ranks divide, and those which choose the valley of the Missouri River move for several days in a westerly direction, following the course of the river.* At Pierce City, Mo., another cause operates to make their arrival still later. Of all the stations in the Mississippi Valley, this is almost the only one where the influence of mountains is felt as a factor in the study of migration. The Ozark Mountains stretch to the south of Pierce City, forming a broad and high barrier to the northward progress of migrating birds.† In the case of some of the larger birds and those possessing great power of flight, the retardation due to the mountains is scarcely noticeable, but with the Warblers a marked effect is perceived. Pierce City is about 150 miles farther south than Saint Louis, and yet the average date of the arrival there of fourteen species of Warblers was eleven days later than at Saint Louis. The Chestnut-sided Warbler reached Mount Carmel, Mo., April 23, and Saint Louis, Mo., April 29, and it was recorded May 4 and 5 at Paris, Ill., Chicago, Ill., Grinnell, Iowa, and Ripon, Wis. May 15 and 16 another wave of migration brought it to Waukon, Iowa, Lanesboro, Minn., Lake City, Minn., New Richmond, Wis., and Elk River, Minn. A single bird was seen at White Earth, Minn., May 17. The bulk was present at Saint Louis from May 5 to May 12, and the last departed May 18.

In the fall of 1885 the last was seen at Grinnell, Iowa, September 10. At Saint Louis, Mo., only a single bird was noted during fall migration, and that was seen September 23.

660. **Dendroica castanea** (Wils.). [100.] *Bay-breasted Warbler.*

Like the Chestnut-sided, this Warbler is an eastern species, which reaches only to the edge of the plains. It has been found in Nebraska, but is not yet known as a bird of Kansas. It winters south and breeds north of the United States, but is common in the Mississippi Valley in spring and fall, and a few are said to breed at Portage la Prairie, Manitoba. Mr. Nehrling states that in southeastern Texas, near Houston, it is

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[* Moreover, the altitude of Mount Carmel is considerably greater than that of Saint Louis.—C. H. M.]

[† Pierce City is in the midst of the Ozark Hills, at an elevation of nearly twelve hundred feet, while Saint Louis is little over 400 feet.—C. H. M.]

one of the commonest Warblers during spring migration. He recorded it as late as May 5. The record shows that in 1884 the species was observed at latitude 37°, May 8; latitude 39°, May 11; and latitude 45°, May 26. Females were seen at Chicago May 23. If the observers knew anything more about the movements of the species they failed to communicate the fact.

In the spring of 1885 the first Bay-breasted Warbler was reported from Pierce City, Mo., May 7; Saint Louis, May 15; Lanesboro, Minn., May 18; and Elk River, Minn., May 20. One was taken at Tampico, Ill., during the spring of 1885.

In the fall of 1885 the first and last was seen at Saint Louis September 25.

661. **Dendroica striata** (Forst.). [101.] *Black-poll Warbler.*

Breeds north of the United States. Few Warblers perform more extended migrations than the Black-poll. The equator and the Arctic Ocean form the extreme objective points of its periodical movements. The earliest record of its migration in 1884 came from Danville, Ill., where it was noted April 27—two days earlier than it was seen at Saint Louis, nearly a hundred miles farther south. This circumstance taken alone would scarcely call for remark, but in studying migration in this region it is found that more than twenty species were recorded at Danville from two to ten days earlier than at Saint Louis. It is evident, then, that some species migrate earlier in the valleys of the Ohio and Wabash than in the same latitude along the Mississippi, although this latter route is usually considered, and not without reason, as the most favorable in the United States. Stations in extreme eastern Illinois are so few that an extended comparison of dates can not be made, but the records seem to indicate that migration in favorable localities along the eighty-eighth meridian is slightly in advance of that along the Mississippi River and the ninety-first meridian up to about Chicago, where the rate of travel along the two routes seems to be about the same. North of Chicago migration by the western route is in advance. This, however, is mainly surmise, and these opinions may be reversed by future and more extended observations. The subject is mentioned here merely to call attention to its importance in future investigations.

Continuing the record north of Saint Louis, it is found that the Black-poll Warblers arrived at Alda, Nebr., May 3; at Iowa City, Iowa, May 17; Polo, Ill., May 19; and Lanesboro and Heron Lake, in Minnesota, and West De Pere, Wis., May 20 and May 21. The bulk came to Saint Louis May 7 and stayed six days; to Manhattan, Kans., May 13, and remained but two days. Irregular and very early dates are May 5 at latitude 42° 18′ in Iowa; May 1 at latitude 44° 32′ in Minnesota; May 4 at latitude 44° 45′ in Wisconsin; and May 18 at latitude 45° 25′ in Minnesota.

In the spring of 1885 the Black-poll Warbler arrived at Saint Louis, Mo., April 29, several days earlier than it appeared at stations in the same latitude farther east and west. At Paris, Ill., none were reported until May 4, nor at Manhattan, Kans., before May 12. One was seen at Des Moines, Iowa, May 5. Like many other Warblers, the Black-poll made a great advance from May 14 to May 16. Between these dates it was reported from Waukon, Iowa; Lanesboro, Minn., Elk River, Minn., and even from White Earth, Minn., where as many as seventy-five were seen May 16. At Saint Louis the bulk arrived May 5; bulk left May 16, and the last one (a female) was seen May 22. It was not seen after May 20 at any other station from southern Missouri to southern Minnesota.

In the fall of 1885 the arrival of the Black-poll at Saint Louis, Mo., September 21, was the only note received concerning its migration.

662. **Dendroica blackburniæ** (Gmel.). [102.] *Blackburnian Warbler.*

Few lovers of forests and birds could fail to notice this brilliantly colored Warbler should they pass near its favorite haunts. It breeds from the heavy forests of northern Minnesota northward, and winters south of our southern border. Like the Chestnut-sided, it is rarely found so far west as Kansas and Nebraska. It is one of the few Warblers of whose entrance into the United States we have a record. In the spring of 1884 it appeared at Rodney, Miss., April 13; advanced to latitude 37° May 2; latitude 39° May 10; latitude 43° May 16; and the most northern record contributed was latitude 45° May 23. This gives an average of 23 miles a day for nearly a thousand miles.

In the spring of 1885 the first Blackburnian Warbler was reported from Pierce City, Mo., May 7; from Saint Louis, Mo., and Hennepin, Ill., May 12; from Lanesboro, Minn., May 16; and from Heron Lake, Minn., May 19. None were seen at Saint Louis after May 13.

In the fall of 1885 the first was seen at Saint Louis September 19, and the last September 25.

663 a. **Dendroica dominica albilora** Baird. [103*a*.] *Sycamore Warbler; White-browed Yellow-throated Warbler.*

This form of the Yellow-throated Warbler is restricted to the southern portion of the Mississippi Valley, extending up to southern Indiana, southern Illinois, and Kansas. Evidently it does not breed in the Lower Rio Grande Valley in Texas, for Dr. Merrill says of it there: "One of the first migrants to return in the autumn, when it is not rare. A few pass the winter." It is one of the earliest migrants among the Warblers, and in the spring of 1884 was reported from Saint Louis April 4, and from Gainesville, Tex., April 7, showing how much later these insect-eating birds move on the plains than farther east. It was noted at Saint Louis that singing suddenly ceased April 30 and was recommenced with great diligence May 31.

In the spring of 1885, at Gainesville, Tex., the first Sycamore Warbler was seen March 22; the next April 9, and the bulk April 17. At

Saint Louis a pair was observed April 6. From April 6 to April 17 these Warblers were conspicuous songsters. May 1 they were almost silent.

In the fall of 1885, at Saint Louis, they had all left their summer stands by October 7, and none were seen later than October 11.

666. Dendroica chrysoparia Scl. & Salv. [106.] *Golden-cheeked Warbler.*

A tropical and subtropical species, ranging from central Texas to Guatemala. The first known specimen from the United States was killed near San Antonio, Tex., about 1864, by Mr. Dresser. In April, 1878, it was taken in Bosque County, Tex., by Mr. G. H. Ragsdale (Bull. Nutt. Ornithological Club, Vol. IV, 1879, p. 60). During the same month (April, 1878) Mr. W. H. Werner found it to be a tolerably common Warbler in parts of Comal County, where four nests were discovered in May (Ibid., pp. 77–79). In March, 1880, Mr. N. C. Brown captured seven specimens at Boerne, Kendall County, where the species was first seen March 12 (*Ibid.*, Vol. VII, 1882, pp. 36, 37); and in the spring of 1883 he secured three more in the same locality (The Auk, Vol. I, 1884, p. 121). Recently Mr. Lloyd, in his list of the birds of Tom Green and Concho Counties, Tex., says of it: "One was shot in a hackberry in April, 1887. Its stomach contained winged ants." (The Auk, Vol. IV, 1887, p. 296.)

667. Dendroica virens (Gmel.). [107.] *Black-throated Green Warbler.*

Breeds from northern Illinois northward, and leaves the United States entirely in winter. In southeastern Texas it is abundant during the migrations (Nehrling). The first note for 1884 came from Saint Louis, where it arrived April 26. May 1 it was noted at Danville, Ill. By May 7 it had reached Minneapolis, Minn., and May 10 it was observed at West De Pere, Wis. In the West it extends to the eastern boundaries of Nebraska, Kansas, Indian Territory, and Texas, but was not reported in 1884 from any of these States.

In the spring of 1885 the records indicate a very rapid migration. Seven days after the first came to Saint Louis, Mo., April 30, they had appeared at Paris, Ill.; Des Moines, Iowa; Lanesboro, Minn., and Elk River, Minn. This would give an average rate of about 70 miles a day. The bulk was present at Saint Louis, Mo., from May 5 until May 15, when they suddenly disappeared. Some late records were sent in. It was reported May 21 at San Antonio, Tex., and June 5 at Des Moines, Iowa.

In the fall of 1885 this Warbler was found migrating through San Angelo, Tex., August 25; and Mr. Lloyd states that in Tom Green and Concho Counties, Tex., it is a common fall migrant from August 1 to September 20. This fact makes it almost certain that it will be found to breed occasionally in the middle portion of the Rocky Mountains. At Saint Louis, Mo., the first came September 17, and the last disappeared October 5.

668. Dendroica townsendi (Nutt.). [108.] *Townsend's Warbler.*

No specimen of this species had been taken in the Mississippi Valley until Mr. Lloyd secured it at San Angelo, Tex. It winters beyond our limits, and ranges in summer through the Rocky Mountains, even to Alaska. It is a summer resident in Tom Green County, Tex., though Mr. Lloyd says that it is rarely secured, as it is found only in the thickest underbrush of a very restricted area. Its nest and eggs are unknown.

In the fall of 1884 Townsend's Warbler first appeared at San Angelo, Tex., September 21, and was last seen there September 26.

In the spring of 1885 the first was seen at San Angelo, May 8.

670. Dendroica kirtlandi Baird. [110.] *Kirtland's Warbler.*

The honor of adding this exceedingly rare Warbler to our district belongs to Mr. Widmann, who captured a specimen at Saint Louis, Mo., May 8, 1885.* It is an eastern species and has been taken at various places from Ohio southward.†

671. Dendroica vigorsii (Aud.). [111.] *Pine-creeping Warbler.*

A hardy Warbler, sometimes wintering as far north as southern Illinois, and one of the few which remain in large numbers in the United States through the winter. It breeds throughout its range, but at very different dates. Those which breed in the Southern States begin nesting in March, while those nesting in Manitoba (where, apparently, it is rare) hardly get their housekeeping affairs arranged before the latter part of June. In Kansas it is rare (Goss). Migration usually begins in March, but it must have been delayed in 1884, as the birds all came at once. All the notes from latitude 37° to latitude 45° were made in the first week in May. Information is much desired concerning the breeding habits of this species in Wisconsin, Minnesota, Kansas, and Nebraska.

In the spring of 1885, at Saint Louis, the first and only Pine-creeping Warbler seen was noted April 24. At Hennepin, Ill., the first was seen April 30, and the next May 1. It first reached Lanesboro, Minn., May 7. Mr. Thomas Miller has taken it at Heron Lake, Minn., and Roberts and Benner killed a female in Grant County, Minn., in June, 1879. Mr. F. L. Grundtvig found it tolerably common in migration at Shiocton, Wis., during the first half of May, 1882.

672. Dendroica palmarum (Gmel.). [113.] *Red-poll Warbler.*

From its winter home in the Southern States and southward, this Warbler migrates through the Mississippi Valley, to breed in the far north. In the spring of 1884 it reached Saint Louis April 18, and Danville, Ill., April 21. No farther advance was recorded until April 27 and April 28, when it was noted all over Iowa, Illinois, and Minnesota up to latitude 43° 43′. Two days later it had reached latitude 44° 32′, Minnesota, and May 3 was reported from Elk River, Minn. (lat. 45° 25′). In the east it was a trifle slower, not being noted at West De Pere, Wis. (lat. 44° 26′), until May 6. The last one left Saint Louis May 9.

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* Bull. Nutt. Ornith. Club, Vol. II, October, 1885, p. 382.

[† On the night of May 21, 1885, a male Kirtland's Warbler killed itself by striking the light-house at Spectacle Reef, in the west end of Lake Huron, near the Straits of Mackinac. (See The Auk, Vol. II, 1885, p. 376.) Mr. Ridgway records another specimen, a male, which was killed at Battle Creek, Mich., May 11, 1883. (The Auk, Vol. I, 1884, p. 389.)—C. H. M.]

In the fall of 1884, at Elk River, Minn., the first and bulk of Redpoll Warblers appeared September 21, and the last was seen October 1.

In the spring of 1885 the records of its migration were not very regular. After the first had been seen at Saint Louis, Mo., the next records were from Rockford, Ill., and Durand, Wis., where it was reported April 26. During the last three days of April it appeared at Des Moines, Iowa, Coralville, Iowa, Chicago, Ill., Waukon, Iowa, and Lanesboro, Minn. May 4 it arrived at Elk River, Minn., and May 5 at New Richmond, Wis. At Saint Louis the bulk was present April 22 to April 29, and the last was noted May 12. At Waukon, Iowa, the last was seen May 13; at Rockford, Ill., May 16; and at Lanesboro, Minn., May 18. At White Earth, Minn., it was very abundant May 16.

In the fall of 1885 the first came to Elk River, Minn., September 28, and to Lanesboro, Minn., September 30. None were seen at Elk River, Minn., after September 28; at Lanesboro, Minn., after October 2; nor at Saint Louis, Mo., after October 26. In Kansas it is a rare migrant (Goss).

672 a. Dendroica palmarum hypochrysea Ridgw. [113 *a.*] *Yellow Palm Warbler.*

This is the eastern representative of the foregoing. It breeds in the Atlantic coast region from New Brunswick and Nova Scotia to Hudson Bay, and winters in the South Atlantic and Gulf States as far west as Louisiana.

673. Dendroica discolor (Vieill.). [114.] *Prairie Warbler.*

The Prairie Warbler winters in Florida and the West Indies, proceeds up the Mississippi Valley to Illinois (and accidentally to Wisconsin), and extends west to eastern Kansas and eastern Nebraska. It is not yet known from Minnesota, though it has been taken by Dr. King at West Liberty, Iowa. In the spring of 1884 it was observed at one station only, namely, Pierce City, Mo., where it arrived April 27. It is quite rare in all the northern portions of its range.

674. Seiurus aurocapillus (Linn.). [115]. *Ovenbird; Golden-crowned Thrush.*

The Ovenbird is an inhabitant of the eastern United States, ranging westward to the eastern foot-hills of the Rocky Mountains. It breeds throughout Manitoba and the northern half of the Mississippi Valley. It breeds abundantly in central and western Dakota, and in Kansas it is a common summer resident. This is rather an early migrant for a Warbler. In the spring of 1884 its record was so thoroughly mixed that we can only surmise that it reached latitude 37° in the early part of April, and latitude 39° the middle of the month. In Minnesota it appeared at Lanesboro April 26, Red Wing April 29, and was recorded from Elk River May 10, but probably arrived there a few days previously. The bulk reached Pierce City, Mo., April 19, where it was very numerous, migrating in flocks. Passing on, the bulk reached latitude 39° about April 26, and latitude 45° May 12.

In the fall of 1884 only one station reported the migration of the Ovenbird. The bulk left Mount Carmel, Mo., September 1, and the last September 21.

In the spring of 1885 it reached Saint Louis, Mo., April 17, and the bulk came three days later. Then there was no regularity in the records until May 5, when it was reported from Chicago; May 6 it reached northeastern Iowa and Minnesota up to Elk River, and May 7 it attained corresponding latitudes in eastern Wisconsin. At Manhattan, Kans., the first was reported May 5.

In the fall of 1885 the first migrant reached Fernwood, Ill., September 8, where it was last seen two days later. The last was seen at Grinnell, Iowa, September 16. At Saint Louis, Mo., it was very numerous September 17. The bulk had left Saint Louis by September 26, and the last followed September 29. In Concho County, Tex., Mr. Lloyd shot one and saw another September 10, 1886.

675. Seiurus noveboracensis (Gmel.). [116.] *Water-Thrush.*

A bird of eastern North America; probably does not occur west of the Mississippi River. It winters in the Southern States, occasionally as far north as southern Illinois, and breeds from northern Illinois northward. The records of its migration are too uncertain to be used.

675*a*. Seiurus noveboracensis notabilis (Grinn.). [116*a*.] *Grinnell's Water-Thrush.*

Takes the place of the foregoing in the region west of the Mississippi River. Occurs from Illinois westward to California and north into British America; winters from the southern border of the United States southward to northern South America, and breeds from northern Kansas northward. Some uncertainty attaches to the records of its migrations.

In the spring of 1884 the most reliable notes received are the following: Latitude 38° 40′ in Missouri was reached April 26; latitude 41° 38′ in Iowa May 3; latitude 41° 40′ in Iowa April 30; latitude 43° 15′ in Iowa April 27; latitude 43° 48′ April 29. It was reported also from latitude 43° 43′ in Wisconsin April 28, but this record may refer to the typical form. These scanty notes seem to indicate that the species spread all at once over the country between latitude 38° 40′ and latitude 43° 50′. On May 12 the last left Saint Louis, but one was seen at Ellis, Kans., as late as May 25.

In the spring of 1885 the first Water Thrush came to Saint Louis, Mo., April 27; to Fayette, Mo., May 1; Hennepin, Ill., May 2; Lanesboro, Minn., May 7; Manhattan, Kans., May 14; Heron Lake, Minn., May 15, and White Earth, Minn., May 16. The bulk reached Saint Louis, Mo., April 30, departed May 12, was followed by the last May 15.

In the fall of 1885 the first returned to Saint Louis, Mo., September 17, and the species was present there just one month.

676. **Seiurus motacilla** (Vieill.). [117.] *Louisiana Water-Thrush: Large-billed Water-Thrush.*

Essentially a southern bird; rarely found north of latitude 42°. It winters below the United States, and while abundant in the southern part of its range is quite rare in the northern. It is quite common in Kansas and occurs at Newton, Iowa, but is rare in Nebraska, and there is no record of its occurrence in Minnesota. In 1884 the first reached Saint Louis March 29 and it was seen again April 4; the bulk came April 18. At Chicago the first was seen April 19, though it may have come sooner. On the plains the birds were later. They were heard at Gainesville, Tex., April 15, and a single one was seen at Manhattan, Kans., April 18, but no more until the bulk arrived, April 26.

In the spring of 1885 the Large-billed Water Thrush first appeared at Gainesville, Tex., March 24; and at Saint Louis, Mo., April 6. It was reported from Mount Carmel, Mo., April 18; from Manhattan, Kans., April 15; and from Des Moines, Iowa, April 18. It arrived at Waukon, Iowa, April 21, and Lanesboro, Minn., April 28. At Heron Lake, Minn., only a few miles farther north than the last, but in the western part of the State, none were seen till May 11. It became common at Manhattan April 18; Des Moines, April 24; Waukon, May 8; and at Heron Lake, May 16. Thus it will be seen that this species has been added to the list of Minnesota birds. At both Lanesboro and Heron Lake all three of the Water Thrushes were found in the spring of 1885. In the fall of 1885 the last left Saint Louis September 29.

677. **Geothlypis formosa** (Wils.). [119.] *Kentucky Warbler.*

The Lower Mississippi Valley is the special home of this species, and it is more abundant there, particularly in southern Indiana, southern Illinois, and southeastern Texas, than in any other part of the United States. In Kansas it is a common summer resident (Goss.). In 1884 the earliest record came from Gainesville, Tex., where it arrived April 15. Both in Kansas and Missouri it reached latitude 39° the last of April. At Saint Louis the first arrived April 28, and the bulk April 30; at Manhattan, Kans., the first came April 30, and it was seen daily after May 1. At Pierce City, Mo., it was common by May 3. May 11 it had reached almost the limit of its northward advance at Burlington, Iowa, though it has been found accidentally in Wisconsin. It has not yet been seen in Minnesota. The species winters outside our limits and breeds throughout its range.

In the spring of 1885 the first Kentucky Warblers came to Gainesville, Tex., April 9, and were common there by April 17. At Saint Louis the first arrived April 21, the bulk April 27, and they were numerous May 4. At Manhattan, Kans., the first were seen May 1.

In the fall of 1885 the last left Bonham, Tex., August 20.

678. Geothlypis agilis (Wils.). [118.] *Connecticut Warbler.*

This is one of the rarest, and hence one of the most interesting Warblers of the Mississippi Valley. In 1883 neither the breeding range nor its winter range was known. In 1884 something was learned of its summer home, but where it spends the winter is still a mystery. The question of its nest and eggs has been answered by Mr. Ernest E. T. Seton (now Ernest E. Thompson), who found a nest on a moss mound in a tamarack swamp near Carberry, Manitoba, concerning which he published an interesting account in the Auk for April, 1884, page 192.

He afterwards stated that this nest was found June 21, 1883. Not the least interesting fact in the life history of this little-known species is its choice of different routes for its spring and fall migrations, passing northward along the Mississippi Valley and returning by way of New England. It is almost the latest Warbler to migrate in spring, coming some time after the Black-polls, which are usually believed to bring up the rear of the Warbler hosts. The only observer who noted it in 1884 was Mr. Widmann, who found it at Saint Louis May 21, at the same spot as in 1882 and 1883. As the birds do not leave latitude 43° until about June 1, it must be very late before they reach their breeding-grounds in Manitoba.

In the spring of 1885 the first Connecticut Warbler was seen at Saint Louis, Mo., May 15, and the last one week later.

679. Geothlypis philadelphia (Wils.). [12[illegible]] *Mourning Warbler.*

In much of the Mississippi Valley the Mourning Warbler is a companion of the Connecticut Warbler in migration, and hardly less difficult to observe. Its life history, however, is well known. It winters south of our border and breeds from Minnesota and eastern Nebraska northward. It is common in western Manitoba. It has been found nesting in Illinois, even south of latitude 39°. In 1884 it was noted by none of the southern observers, the first record being that of its arrival at Saint Louis May 21. During the next week it was observed at Elk River, Minn. At Lanesboro, Minn., May 25, a male was taken with most of its breast black.

In the spring of 1885 Texas was well represented in the records of the Mourning Warbler. It was seen at San Antonio, April 28; at Bonham, May 14, and at Gainesville at the very late date of May 22. It reached Saint Louis, May 13; Emporia, Kans., May 15; Des Moines, Iowa, May 15; Lanesboro, Minn., May 18; Elk River, Minn., May 16, and White Earth, Minn., May 18. Thus it will be seen that in the northern portion of its range it is a very rapid migrant. The last at both Saint Louis and Des Moines was noted May 22.

In Concho County, Tex., it is a tolerably common fall migrant, but has not been seen later than September 1 (Lloyd).

680. Geothlypis macgillivrayi (Aud.). [121.] *Macgillivray's Warbler.*

Along the extreme western edge of the Mississippi Valley this Warbler takes the place of the preceding. An exceptionally eastern record was its occurrence at Gainesville, Tex., where it was taken May 16, 1884. Mr. Lloyd says it is abundant in Texas from Castle Hill to Pecos River, and probably breeds. It has not been reported from any other part of the district, but was taken in Dakota years ago by J. A. Allen. In the fall of 1884 another specimen was secured at Gainesville, Tex., September 3.

681. **Geothlypis trichas** (Linn.). [122.] *Maryland Yellow-throat.*

The typical eastern Maryland Yellow-throat barely reaches the eastern border of the Mississippi Valley, where the prevailing form is intermediate between it and the western.

681a. **Geothlypis trichas occidentalis** Brewst. [——.] *Western Maryland Yellow-throat.*

This lately-described subspecies is the common Maryland Yellow-throat of the western part of the Mississippi Valley from western Manitoba to middle Texas. Throughout the middle and eastern portion of the Mississippi Valley the prevailing form is intermediate between it and typical *trichas*, but, as Mr. Ridgway tells me, is nearer *occidentalis* than *trichas*. Hence all the records relating to Maryland Yellow-throats have been brought under the present subspecies.

From its winter home in the Southern States and southward this Warbler began its pilgrimage in the spring of 1884 early in March. By March 13 it had appeared at Gainesville, Tex., but nothing more was heard of it until April 18, when it arrived at Saint Louis. April 27 found it at Danville, Ill., and April 30 was a day of great migration in Iowa, where it was reported from latitude 41° 38′, latitude 41° 40′, and latitude 43° 15′; May 2 it had advanced to latitude 43° 43′ in Minnesota; May 10 to latitude 45° 25′; and May 26 it had penetrated even to Oak Point, Manitoba. The bulk was found eight to twelve days in the rear of the advance.

In the fall of 1884 the bulk of Maryland Yellow-throats was reported as leaving Williamstown, Iowa, August 22, and the last six days later. At Des Moines, Iowa, the last was reported August 11. At Mount Carmel, Mo., the last one left September 22.

In the spring of 1885 the earliest note came from San Angelo, Tex., where the first was seen April 4, and the species was common the next day. April 20 it appeared at Saint Louis, Mo., and Odin, Ill. April 21 one was noted from Paris, Ill. During the three days from April 23 to April 25 Maryland Yellow-throats were seen at Emporia, Kans.; Iowa City, Iowa; Newton, Iowa; Grinnell, Iowa; and Hennepin, Ill. May 3 found them at Unadilla, Nebr., and a further advance (May 8 and 9) brought them to Huron, Dak.; Coralville, Iowa; La Porte City, Iowa; Waukon, Iowa; and Lanesboro, Minn. The next advance occurred May 14, bringing them to Delavan, Wis.; River Falls, Wis.; Heron Lake, Minn.; and Elk River, Minn. May 16 one was seen at White Earth, Minn. The bulk came to Saint Louis April 24, and the species was most abundant there April 27.

In the fall of 1885 the last migrant left Elk River, Minn., September 24. At Grinnell, Iowa, the last was seen September 26, and at Mount Carmel, Mo., September 27. They were numerous at Saint Louis, Mo., September 16, but the bulk had departed before September 26. The last was noted September 29. A very late migrant was seen at Lanesboro, Minn., October 3.

683. Icteria virens (Linn.). [123.] *Yellow-breasted Chat.*

A summer resident in all but the northern part of the Mississippi Valley, east of the plains.

Wintering beyond our southern border, it entered the district in the spring of 1884 about the 1st of March. March 15 it was reported from Gainesville, Tex., and April 25 from Manhattan, Kans. The next day found it at Saint Louis, Mo., but while the bulk was reported as arriving at that place April 29, the bulk was not recorded from Manhattan, Kans., until May 10. This day, May 10, seems to have been the day of special movement for the Chat, as on that day it was noted from latitude 41° 40′ in Iowa; latitude 42° 18′ Iowa; and latitude 40° 08′ in Illinois. It has been reported in past years from southeastern Dakota and southwestern Minnesota, but in 1884 the most northern notes were from central Nebraska and central Iowa. Thus, contrary to the usual rule, it reached Manhattan, Kans., before it did Saint Louis, Mo.; and, furthermore, the dates from Illinois were later than those from Missouri and Iowa. For example, for latitude 39° 19′ in Illinois, the date is May 7; for latitude 40° 08′ in Illinois, May 10; for latitude 42° 16′ in Illinois, May 13. These observations, coupled with the fact that the species is not known to winter in the West Indies, though found in Central America and Mexico, would make it probable that most of the individuals enter the United States through Mexico, and that the migration is in a northeasterly direction.

In the spring of 1885 the earliest record of the Yellow-breasted Chat came from the extreme southwest, where it was seen at San Antonio, Tex., April 14. It reached Gainesville and Bonham, in northern Texas, April 17 and April 18. At Saint Louis, Mo., Chats were seen April 21; at Manhattan, Kans., April 22; at Mount Carmel, Mo., April 30; Corinth, Miss., April 30; Newton, Iowa, April 30; Fayette, Mo., May 1; Des Moines, Iowa, May 11; Huron, Dak., May 12; and Grinnell, Iowa, May 18. Thus the record in 1885 was not so regular as in the previous year.

In the fall of 1885 the last Chats at Grinnell, Iowa, and Mount Carmel, Mo., were seen July 20. At Saint Louis, Mo., they remained until August 18. But none were seen at Bonham, Tex., after August 6. Mr. Lloyd says it is a tolerably common spring migrant in Tom Green and Concho Counties, Tex.

683 a. Icteria virens longicauda (Lawr.). [123 a.] *Long-tailed Chat.*

The habitat of this Chat touches the western part of our district along the edge of the plains. Colonel Goss has found it breeding in western

Kansas. In the spring of 1884 it was found at San Angelo, Tex., May 12. Mr. Lloyd says it is an abundant breeder in Tom Green and Concho Counties, Tex.

In the fall of 1884 the last was heard at San Angelo September 27.

In the spring of 1885 it first arrived at San Angelo April 16, and had become common there by the 20th. A nest with four eggs was taken May 5.

In the fall of 1885 it was leaving San Angelo September 16.

684. **Sylvania mitrata** (Gmel.). [124.] *Hooded Warbler.*

A Southern bird, scarcely noticed by the observers. Winters south of the United States, and passes up the Mississippi Valley to breed. Has been taken in Wisconsin, Iowa, eastern Kansas, and southern Nebraska. It breeds in eastern Kansas, but is rare (Goss). Mr. Nehrling thinks it does not breed in southeastern Texas, where it is a common migrant. The record from Saint Louis is: "April 24, first, one male in song; April 30, several males in song; May 9, one of the noisiest birds in the woods; May 21, sitting on eggs already incubated." May 3 it was quite common at Pierce City, Mo.

In the spring of 1885, at Corinth, Miss., the first migrant was seen April 8; and it had become common by April 15. At Saint Louis, the record was: "April 24, first, two males; April 27, bulk arrived; April 30, height of migrating season, and mating began." In the fall of 1885 the last left Saint Louis September 29.

685. **Sylvania pusilla** (Wils.). [125.] *Wilson's Warbler; Black-capped Yellow Warbler.*

This is almost the only Warbler which is found over the whole of the United States. Dr. Coues tells us that the bulk pass through the United States by way of the Rocky Mountains, but there are enough left to make it a common bird in the Mississippi Valley and most of Manitoba. It does not winter in the United States, and Minnesota is the only State of our district in which it has been found breeding. In southeastern Texas it is a very common migrant (Nehrling; Merrill). In the spring of 1884 it reached latitude 40° May 1; latitude 43° May 10; and latitude 45° May 20. In the West it was taken at San Angelo, Tex , May 5. The last one left Saint Louis May 17.

In the fall of 1884 the last Black-capped Yellow Warbler was seen at Williamstown, Iowa, August 23. At San Angelo, Tex., it was last reported September 27. The first reached Gainesville, Tex., September 3.

In the spring of 1885 the earliest record came from San Angelo, Tex., where it was seen April 16. It reached Saint Louis April 29; Paris, Ill., May 5; Des Moines, Iowa, May 6; Lanesboro, Minn., May 7; and Rochester, Minn., May 8. May 16 it was seen at Heron Lake, Minn., River Falls, Wis., Elk River, Minn., and White Earth, Minn. At this latter place about sixty were seen. At Saint Louis the bulk was present from May 5 to May 9, and the last was seen May 22, which is a later date than that given at any other station.

In the fall of 1885 the first reappeared at Saint Louis, Mo., September 3; they were scarce September 17, and the last left September 22. Mr. Lloyd says it is an abundant migrant "all over western Texas from April 2 to May 15, and from September 3 to 30."

686. **Sylvania canadensis** (Linn.). [127.] *Canadian Warbler.*

This handsome Warbler is less common in the Mississippi Valley and Manitoba than farther east. It does not winter in the United States, but breeds sparingly in the Northern States, and abundantly in Canada. It has been known to breed in northern Illinois. It extends westward only to the eastern edge of Kansas and Nebraska. It occurs in southeastern Texas in migration, but is not common (Nehrling). In the spring of 1884 it arrived at latitude 37° April 29, latitude 39° May 11, and at Lanesboro, Minn. (lat. 43° 43′) May 24. The last was seen at Saint Louis May 21.

In the spring of 1885, at Saint Louis, the first was seen May 11, the bulk was present from May 13 to May 19, and the last left May 22. At Lanesboro, Minn., the first was reported May 15, and at Elk River, Minn., May 16. In Wisconsin, it was first reported from Durand May 15; and from New Richmond, May 19.

In the fall of 1885 the first returning migrant was seen at Saint Louis September 22; while at San Angelo, Tex., one was shot from a flock of six August 28.

687. **Setophaga ruticilla** (Linn.). [128.] *American Redstart.*

The Redstart is a common summer resident of the upper half of the Mississippi Valley and Manitoba. As far south as Kansas it is a common breeder. It does not remain in the United States during the winter, nor does it cross our boundary before the first of April. In the spring of 1884 the first record came from Saint Louis April 17, and the next, from latitude 40° 08′ in Illinois, April 27. The last day of the month it was seen at latitude 39° 12′ in Kansas. For the first week of May there was not a record; May 8 it reached latitude 41° 36′ in Iowa; and May 10, 11, and 12, it spread abundantly over the immense district from latitude 41° to latitude 45° 25′. By May 28 it had crossed our northern border and arrived at Portage la Prairie, Manitoba (lat. 50°).

The great changes and diversity in plumage in this species enable the observant ornithologist to note very fully the arrival of the different ages and sexes. Thus at Saint Louis the following record was made by Mr. Widmann:

> April 17, first old males; April 26, bulk of old males; April 30, first females; May 7, height of transient old males; May 9, height of transient females; May 11, first one-year-old male; May 16, young males more conspicuous than old males.

This is one of the species in which the period of arrival at any locality extends over several weeks, the bulk coming many days behind the first. Hence, all notes of first and bulk on the same day are self-evident mistakes. The bulk never arrives till a week after the first, and ten to twelve days is the ordinary time.

In the fall of 1884 the last Redstart was seen at Mount Carmel, Mo., September 11.

In the spring of 1885 Redstarts were reported from San Antonio, Tex., April 28; Gainesville, Tex., May 8; Emporia, Kans., May 11; and Manhattan, Kans., April 22. So much for the regularity of its Western record. The rest of the notes were scarcely more regular. At Reeds, Mo., the first was seen April 4; at Saint Louis, Mo., April 20 (with the bulk of males and first female April 27); Paris, Ill., April 28; southern Iowa, and Chicago, Ill., May 5. The rest of the timbered portion of the district to latitude 45° was reached May 14 and May 15; and May 18 one was seen at White Earth, Minn. Such are the outlines, but the details are not arrangeable.

In the fall of 1885, at Grinnell, Iowa, the last Redstart was seen September 28; at Mount Carmel, Mo., September 20; and at Saint Louis, Mo., where they had been numerous September 17, the last was seen September 29. The first migrant reached San Angelo, Tex., September 11. In Concho County, Tex., it is an abundant fall migrant.

688. **Setophaga picta** Swains. [129.] *Painted Redstart.*

An inhabitant of the highlands of Mexico, coming north to our southern border in Texas, New Mexico, and Arizona.

689. **Setophaga miniata** Swains. [130.] *Red-bellied Redstart.*

Another inhabitant of the highlands of Mexico, coming north to southern Texas (Giraud).

690. **Cardellina rubrifrons** (Giraud). [131.] *Red-faced Warbler.*

The home of this bird is in the highlands of Gautemala and Mexico, extending northward to our southern border in Texas and Arizona.

691. **Ergaticus ruber** (Swains.). [132.] *Red Warbler.*

Inhabits the highlands of eastern Mexico and thence north to Texas (Giraud).

692. **Basileuterus culicivorus** (Licht.). [133.] *Brasher's Warbler.*

Another tropical species, coming north to southern Texas (Giraud).

693. **Basileuterus belli** (Giraud). [134.] *Bell's Warbler.*

Like the last, a Mexican species, recorded from Texas by Giraud.

697. **Anthus pensilvanicus** (Lath.). [71.] *American Pipit; Titlark.*

Breeds in the far north, migrates through Manitoba and the Mississippi Valley and winters from the Southern States southward, sometimes north to southern Illinois. In southeastern Texas it is an abundant winter resident. Although this bird is found over the whole of North America, all the 1884 notes concerning it came from the region west of the Mississippi. In the spring of 1884 it arrived at Gainesville, Tex., March 12; Manhattan, Kans. (where it was common for about a week), April 13; Vermillion, Dak., April 24; and Elk River, Minn., May 4. At Ellis, Kans., the first were taken May 2.

In the fall of 1884 the Titlark was first seen at Gainesville, Tex., November 1.

In the spring of 1885 the first migrant was seen at Gainesville March 10; at Manhattan, Kans., April 15; at Des Moines, Iowa, April 18; and at Elk River, Minn., May 6.

In the fall of 1885 it was first seen at Gainesville November 13; and a flock was seen there November 18. Mr. Lloyd states that in western Texas it is "common in fall migration; less common in spring."

700. Anthus spragueii (Aud.). [73.] *Sprague's Titlark.*

Breeds abundantly in the Assinaboine region, and in Dakota and western Minnesota. Since Dr. Coues, in his "Birds of the Northwest," queried whether Sprague's Lark left Dakota for the winter, much has been learned of its movements. We now know that its winter haunts lie far from Dakota, and that it penetrates even to the south of southwestern Texas. Just where it winters seems not yet determined, but as the record now stands it appears to winter below the United States.* Mr. Nehrling found it in small flocks near Houston, Tex., in early November, but it soon disappeared. Mr. Nathan Clifford Brown did not find it at Boerne, near San Antonio, Tex., until March 16, so that its winter home must be south of these points. At Gainesville, Tex., it was seen as late as May 7. While northern Dakota and western Manitoba constitute its special breeding grounds, where it nests in great numbers, yet it can be found in summer in western Minnesota, in Nebraska (where it arrives about the middle of May), and probably also in western Kansas. Colonel Goss says of it in his List of the Birds of Kansas: "Migratory, rare"; but Dr. Watson writes from Ellis, Kans.:

> I am in doubt how to classify this bird, but I think it is a summer resident. During what should be its breeding season I have seen birds ascend almost to invisibility, but lost sight of them in the descent, and they were not captured.

As the soaring he describes is confined to the breeding season, the birds he saw probably had nests in the vicinity.

In Tom Green County, Tex., on the edge of the plains, one was shot in January, 1885. In the spring of 1885 Sprague's Titlark, or Pipit, was first seen at San Antonio, Tex., February 26. At Gainesville, Tex., the first was seen April 8 and the last May 6.

In the fall of 1885 the first was seen at Gainesville October 12, and the next November 2. In Concho County, Tex., a small flock was seen October 15, 1886 (Lloyd).

701. Cinclus mexicanus Swains. [19.] *American Dipper;* Water Ouzel.

The home of the Water Ouzel, or Dipper, is along the mountain streams of western North America. According to Professor Aughey it is "rare over most of Nebraska, but abundant in Oteo County;" and Grinnell has recorded it from the Black Hills of Dakota.

[*It has been recorded as wintering in immense flocks in central Arkansas, in company with Lapland Longspurs (Coues, Bull. Nutt. Ornith. Club, Vol. IV, 1879, p. 238). —C. H. M.]

702. Oroscoptes montanus (Towns.). [10.] *Sage Thrasher.*

This is scarcely a bird of the Mississippi Valley, since, as its name implies, its favorite home is in the sage-covered plains of the Great Basin. It is introduced here on account of its occurrence in western Texas, where Mr. Lloyd, at San Angelo, found it an occasional visitant. The species is also migratory, passing north along the Rocky Mountains, about to the northern boundary of the United States.

In the spring of 1885 the first Sage Thrashers (about 20 in number) were reported from San Angelo, Tex., April 1; and the last the next day. They were said to be common there during migration. Recently Mr. Lloyd has published the following concerning the distribution of this species in Texas: "Tolerably common resident in Tom Green County. Winters in Concho County as far east, at least, as Colorado. No eggs found, but I have seen scores of nests."—(The Auk, Vol. IV, 1887, p. 297.)

703. Mimus polyglottos (Linn.). [11.] *Mockingbird.*

The Mocking-bird is a permanent resident in the southern part of the Mississippi Valley. Its migrations are not great. In winter it retires but a short distance south of its northern breeding range, and in spring is rather late in returning. The Gulf States constitute its true winter home, and there it is found in abundance. Many individuals remain much farther north, and are to be seen occasionally during cold weather. In the winter of 1883–'84 at Caddo, Ind. Ter., it was seen about half a dozen times; at Saint Louis, Mo., one was seen January 29, 1884, and even so far north as Burlington, Iowa, it was twice seen during the winter. It is possible that these last were escaped cage birds, but there was nothing in their actions to indicate it. Mocking-birds began to leave winter quarters about the middle of March, 1884, reaching latitude 37° March 20, and occupying almost a month in their journey from that point to latitude 39° in Missouri, which they reached April 14. In Kansas, however, it was long delayed. At Manhattan, "in 1883, it arrived April 10, but in 1884 cold rains prevented its early appearance, and the first was not seen until May 22, and then only two or three pairs came. Usually it is common." The normal northern limit was reached the first week in May. In the Southern States the song period began about March 1, but it was almost June before the northernmost birds found their voices. North of latitude 40° there are only a few records of the birds' summer residence, and these are in central and southern Iowa.

In the fall of 1884 the last Mockingbird left Mount Carmel, Mo., October 21, while the bulk left October 10. At Shawneetown, Ill., a single bird was reported as staying all winter, and at Peoria, Ill., the species has been seen in midwinter. At Gainesville, Tex., some Mockingbirds spent the winter of 1884–'85.

In the spring of 1885, at Gainesville, Tex., the number present during winter was increased March 6 by the arrival of the first migrants, and the species had become common by March 31. Mockingbirds reached Pierce City, Mo., April 17; Peoria, Ill., April 19; Griggsville, Ill., April 21; Saint Louis, Mo., April 24; Mount Carmel, Mo., May 2, and Manhattan, Kans., April 26.

In the fall of 1885 the last was seen at Saint Louis, Mo., October 24. Mr. Lloyd states that it is an abundant resident in Tom Green and Concho Counties, Tex.

704. **Galeoscoptes carolinensis** (Linn.). [12.] *Catbird.*

A common summer resident throughout the Mississippi Valley and Manitoba; rare in southeastern Texas (Nehrling). In the spring of 1884 fifty-one observers contributed notes upon the movements of the Catbird. It was reported as a winter resident at Waverly, Miss., and at San Angelo, Tex. At the latter place it was marked "occasional."

Its northward movement in migration does not take place until the weather becomes warm and settled. Curiously enough, its first ap-appearance in 1884 was reported from Danville, Ill. (lat. 40° 08′), April 3; while at Rodney, Miss. (lat. 31° 52′), it was not reported until April 13. April 18 it was noted at latitude 41° 10′ in Illinois; and April 20 at latitude 40° 50′ in Iowa. Five days later one was observed at Saint Louis (lat. 38° 40′).

Looking at these few records and knowing little of the state of the weather during these three weeks of April, one would imagine that the Catbird was exceedingly erratic in its movements; and a further study of the records might do little towards dispelling this opinion.

Taking the eastern line of migration, from Mississippi to Wisconsin, we find a general advance about April 29. On that day and the next it was reported at various stations in Illinois, from Hillsborough (lat. 39° 12′) to Chicago (lat. 41° 51′). By May 7 the van had reached West Depere, Wis., and the bulk had arrived at Hillsborough and Polo, Ill. It was reported as arriving at Green Bay, Wis., May 8, and the bulk reached the same place May 15. West of the Mississippi the earliest arrival was reported from Burlington, Iowa, April 20. April 26 the bulk arrived at Pierce City, Mo. April 28 Catbirds had appeared at Fayette, Mo., and Manhattan, Kans., while at Saint Louis they were still scarce. April 29 the bulk appeared at Saint Louis, at which place both sexes were at breeding stands, and flocks of transients were present. April 30 the first was reported from Des Moines and Coralville, Iowa, while the bulk arrived at Manhattan, Kans. On the same day they first appeared at Oak Point, Manitoba. This last must be either a mistake or an extraordinarily early record. A delay of nearly a week in the general movement followed. May 8 the first was noted at Ames and La Porte, Iowa, and at Vermillion, Dak.; May 9 at Minneapolis, Minn.; May 11 at Elk River, Minn.; and May 17 at Frazee City, Minn. In all cases the bulk followed within a week after the first individuals had been seen. Farther west, on the plains, where fewer individual of these species are met with, they were reported as arriving somewhat later. At Gainesville, Tex., they appeared May 12, and remained about two weeks. At Alda, Nebr., the first arrival was May 14, while at Ellis, Kans., farther west, and in latitude 38° 55′, they were not seen until May 25. The notes received from observers contained little more than the dates of first appearance and the arrival of the bulk. The few records from near the southern border of the district leave us in doubt as to the extent to which Catbirds wintered in that section; but we know from previous records that they are somewhat common in the Gulf States east of Texas, and occasionally in mild winters a few have been found in southern Illinois; but in Texas, even in the southern part, the Catbird is rare during the winter, and not very common during migration or in summer. The notes from Mr. Widmann, of Saint Louis, are in striking contrast to those of most observers. They read:

> April 25, first one mewing; April 28, still scarce; April 29, bulk arrived; May 5, height of season, great numbers present, chasing, singing, mewing, fighting, bulk of transients present; May 8, bulk of transients departed; May 10, building.

The Catbird is also reported as building at Manhattan, Kans., May 9.

In the fall of 1884 only four notes were contributed on the migration of the Catbird. At Williamstown, Iowa, the bulk departed August 28, and the last was seen September 11. At Unadilla, Nebr., the last was seen August 9; at Des Moines, Iowa, September 24; and at Mount Carmel, Mo., September 22; the bulk having left one week previously.

In the spring of 1885, the earliest record of the movements of this species came from the northern edge of its usual winter home. At Corinth, Miss., the first was seen April 9, but no more until April 14. By April 17 they were reported at Shawneetown, Ill., probably coming with the warm wave which culminated there the night before. At Saint Louis, Mo., they were first seen April 20; and at Paris, Ill., April 22. With the exception of two stragglers seen at Manhattan, Kans., April 21, no record of movement at this time was made in the country west of the Mississippi River. The birds rested until the pronounced warm wave of the last few days of the month, and then moved forward. Records were received of its presence, April 28 and April 29, at Peoria, Aledo, and Hennepin, Ill.; Keokuk, Iowa; Glasgow, Mo., together with a note on its second arrival at Manhattan, Kans. The first was recorded May 1, at Reeds and Mount Carmel, Mo., and by both of the observers at Fayette, Mo., indicating that there was a special movement in Missouri on that date. The Catbirds did not rest very long before the next movement. Their advance may be seen from the following dates: They reached Richmond, Iowa, May 2; Mount Pleasant, Iowa, and Tampico, Ill., May 3; Chicago, Ill., Rockford, Ill., and Leeds Center, Wis., May 4. During the cold weather of the second week of May odd records were made at Grinnell and Waukon, Iowa; Delavan, Wis., and Lanesboro, Minn., where Catbirds were seen May 7 and May 8; on May 12 they were reported from Williamstown, Iowa; Rochester, Minn., and Stoughton, Wis. Early birds had been seen at Lake City, Minn., May 3, and at Elk River, Minn., May 6. The regular advance did not reach these places until May 15, on which date it was reported also at Hastings and Minneapolis, Minn., and River Falls, New Richmond, and Green Bay, Wis. The next day (May 16) about twenty were seen at White Earth, Minn. During the cold period the bulk overtook the advance guard, so that by the middle of May the van and bulk were moving almost together. This is shown by the fact that while May 15 marked the arrival of the first at the above-named stations, enough more came the next night to make the species common May 16. May 20 they were recorded as arriving at Huron, Dak. No reports were received from the region between latitude 45° and latitude 49°, but May 25 and 26 they occupied the whole of Manitoba to latitude 50° 30′.

In the fall of 1885 the last Catbird left Elk River, Minn., September 12; Des Moines, Iowa, September 18; and Mount Carmel, Mo., September 10. At Saint Louis, Mo., they were numerous from September 16 to 26; the bulk left September 29, and the last followed October 6. Very late migrants were seen at Milwaukee, Wis., October 24, and Fayette, Mo., November 20; while at Bonham, Tex., where they had been reported during the three previous winters, not a Catbird was seen during the winter of 1885–'86.

705. Harporhynchus rufus (Linn.). [13.] *Brown Thrasher.*

The Brown Thrasher is a common summer resident throughout the Mississippi Valley and Manitoba, and winters in the Gulf States and southward. In 1884 reports upon its migration were received from 85 observers. The species is so easily recognized that it is not likely to be overlooked, but its movements on its first arrival are so stealthy and retired that it may be present for several days without being observed, unless the weather is fine. In the winter of 1883–'84 it was reported as a winter resident at Waverly, Miss., Mermenton, La., and Abbeville, La., being abundant at the two last-mentioned places. At Corinth, Miss., a single bird was seen December 28, 1883, and January 10, 1884. The observer adds that they were never seen there before during thirty years residence. They have been known to winter as far north as southern Illinois. The first record of its appearance north of Mississippi and Louisiana in 1884 was made at Danville, Ill., March 15.

This was probably a straggler. The first general movement took place about March 22. On that day a single male, in high plumage, but silent, appeared at Saint Louis. The following day three males were observed at their old stands, in song. The same day (March 23) it was reported from Odin and Carlinville, Ill.; and April 1 from Hillsborough and Griggsville, Ill. April 4 the bulk arrived at Reeds, Mo., and April 10 at Mount Carmel, Mo. April 12 the first arrived at Linwood, Nebr. Two days later the bulk reached Saint Louis, Mo. April 17 the first appeared at Manhattan, Kans., and April 19 at Coleta, Ill. This date was the height of the season at Saint Louis, Mo., where the number was swelled by the presence of both transients and summer sojourners. A decided northward impulse was observed during the next week. April 21 the first arrived at Richmond, Iowa; and April 26 at the following places: Polo, Ill.; Des Moines, Iowa; Iowa City, Iowa; Grand Junction, Iowa; and Hastings, Minn. April 27 the first was seen at Lanesboro, Minn.; April 28 at Lake Mills, Wis.; and April 30 at Red Wing and Elk River, Minn. On the same day the bulk arrived at Grand Junction, Iowa; Lanesboro, Minn.; and Manhattan, Kans. These movements show that the line of heaviest and earliest migration was along the Mississippi River. Thence it spread up the valleys of the rivers and streams tributary to it. Migration seemed to be at its height about the end of April. May 1 the first arrival was noted at Green Bay, Wis., and the bulk arrived at Elk River, Minn. May 5 Brown Thrashers were seen at Vermillion, Dak.; May 13 at Huron, Dak.; and May 21 at Oak Point, Manitoba. Only one note of its breeding was recorded. This was at Saint Louis, Mo., where young were found as early as May 30. At Manhattan, Kans., they were building May 9.

In the fall of 1884 the following records were received of the southward movements of the Brown Thrasher: At Williamstown, Iowa, the bulk left August 18, and the last August 29; at Unadilla, Nebr., the last was seen August 23; at Des Moines, Iowa, September 17. The bulk left Mount Carmel, Mo., September 20, and the last September 25. The first reached Gainesville, Tex., September 26.

In the spring of 1885 no notes were contributed on its movements until it reached southern Illinois. It arrived at Shawneetown March 27. At Saint Louis, Mo., the first came April 2, two days earlier than it was reported at Paris, Ill., to which place it was carried by a tremendous bird wave, which reached there the afternoon and evening of April 4. To the westward of Saint Louis the birds waited for the next warm wave, reaching Glasgow, in north central Missouri, April 6. In the Ozark Hills, in southwestern Missouri, they were reported as arriving at Pierce City and Reeds April 4. Still farther west, in east central Kansas (at Richmond and Manhattan), they did not put in an appearance until April 15. The only station in the vicinity of the Mississippi River at which they were reported between latitude 39° and latitude 41° was Griggsville, Ill., where they were seen April 11. As this date and locality coincided with the maximum of a warm wave, it may be supposed that this wave carried the van to latitude 40°.

The next movement was quite regular. It began at Ferry and Mount Pleasant, Iowa, April 19; the next day extended to Iowa City, Iowa, and crossed the river to Aledo, Tampico, and Hennepin, Ill.; while the third day a great rush brought the birds to Des Moines, Coralville, Grinnell, and Newton, Iowa, Rockford, Ill., and Lanesboro and Lake City, Minn. This was one of the most pronounced movements of the whole season of migration, and it was carried still farther forward on April 22 and April 23, by the arrival of Brown Thrashers at Milwaukee, Lake Mills, Leeds Center, Ripon, and Durand, Wis., and Minneapolis, Minn. At Elk River, Minn., the first was seen May 1. On the plains the advance was about two weeks later. Linwood, Nebr., was reached April 24; Huron, Dak., May 15; and Shell River, Manitoba, May 23.

In the fall of 1885 the last Brown Thrasher left Elk River, Minn., September 12; Des Moines, Iowa, September 16; Grinnell, Iowa, September 28; and Mount Carmel, Mo., October 10. At Saint Louis, Mo., they were numerous from September 16 to 26; the bulk left September 29, and the last October 16. At Bonham, Tex., where they are common winter residents, the first came September 19, and they had become common by November 19.

706. Harporhynchus longirostris (Lafr.). [13 a.] *Long-billed Thrasher.*

An inhabitant of eastern Mexico and the valley of the Lower Rio Grande in Texas, where it is an abundant resident (Merrill; Sennett).

707. Harporhynchus curvirostris (Swains.). [15.] *Curve-billed Thrasher.*

The home of this species is on the table-lands of Mexico, and thence north to the valley of the Rio Grande River in Texas. It is a common resident on the Lower Rio Grande, and is found as high up as Eagle Pass, where it breeds abundantly.

713. Campylorhynchus brunneicapillus (Lafr.). [54.] *Cactus Wren.*

In our district this species is found in western Texas only. At Eagle Pass it is resident, and began nest-building February 26, 1884.

In the fall of 1885 three specimens were secured at San Angelo, Tex., which is a northern locality for the species. In May, 1886, Mr. Lloyd found young at Saragossa P. O., Tex., which is in approximately the same latitude as San Angelo, but farther west. He says that it is probably resident on the plains in Tom Green County.

715. Salpinctes obsoletus (Say). [58.] *Rock Wren.*

The Rock Wren occurs from the Plains to the Pacific, and is supposed to breed throughout most of its range. A few notes concerning it were received from the western part of the district, and it is known that the species migrates principally west of the 99th meridian. It has been taken once in Decatur County, Iowa, and there is a record that a "Cañon Wren," probably this species, was shot among the rocky bluffs of the river at Kansas City, Mo. In the western part of Kansas it is found at Ellis as a common summer resident. At San Angelo, Tex., it was given merely as a winter resident, arriving from the North September 10, in 1883, and leaving May 10, in 1884. Some distance southeast, near Boerne, a female was shot March 4, 1880 (Brown).

717. Catherpes mexicanus (Swains.). [59.] *White-throated Wren.*

This Wren is resident in Mexico and southern Texas.

717a. Catherpes mexicanus conspersus Ridgw. [59a.] *Cañon Wren.*

The Cañon Wren inhabits the southwestern United States from western Texas and Colorado westward. During the winter of 1879–'80 Mr. N. C. Brown discovered about three pairs in a cañon on Cibalo Creek, near Boerne, Tex.; and Mr. William Lloyd found it common at Fort Davis, Tex.

718. Thryothorus ludovicianus (Lath.). [60.] *Carolina Wren.*

An abundant resident in the southern portion of the Mississippi Valley. Its movements in migration are very slight, and are confined to the northern portion of its range, namely, southern Nebraska, southern Iowa, and northern Illinois. The few individuals that find their way to these sections retire southward in winter, and a slight decrease in numbers during the winter is also discernible south to about latitude 38°; below this there is no change. This species belongs more particularly to the East, being seldom found west of longitude 99°. In Kansas, where it is resident, it is abundant in the eastern but rare in the western part of the State (Goss).

The form of the species once recognized as Berlandier's Wren (*Thryothorus ludovicianus berlandieri*), but not now considered distinct, occurs in southwestern Texas. It was somewhat common at San Angelo during the winter, and one or two were seen every few days until May 6. It probably breeds, though Mr. Lloyd has not yet found any nests.

719. Thryothorus bewickii (Aud.). [61.] *Bewick's Wren.*

The distribution of this species over the Mississippi Valley is very irregular. Abundant in some places and rarely or never seen in contiguous territory, it seems to be governed by fancy in the choice of a dwelling place. Like the Carolina Wren, it is not strictly a migratory species, but leaves the northern portions of its range and winters from southern Illinois southward. In summer it is exceedingly abundant in southern Indiana and some parts of Illinois, being the common "House Wren" to the exclusion of *Troglodytes aëdon*. The same is true of eastern Texas, and of some places in Missouri. West and north of these States it is not common. It is not common in Kansas, and is rare in Nebraska. Dr. Hatch's note for Minnesota, stating that it is "common in summer," would better express the facts did it read: "Not uncommon during summer in a few localities in the southern part of the State." Its limited migration is performed in the last week of March and the first few days of April.

In the spring of 1885, at Gainesville, Tex., the first Bewick's Wren was reported March 6, and the next March 28. At Pierce City, Mo., the first was seen March 31. At Saint Louis the first was seen March 30, and the species became common the next day.

719b. Thryothorus bewickii bairdi (Salv. & Godm.). [61b.] *Baird's Wren; Texas Bewick's Wren.*

An abundant resident in Texas, and not uncommon in southwestern Kansas (Goss). At Caddo, Ind. Ter., only 30 miles north of the Texas line, specimens of Bewick's Wren killed in December, when the species was most common, apparently were typical *bewickii*. It disappeared in the early spring, but the people of town said it would come again and be the House Wren of the summer. As the Texas form is known to be abundant only a few miles southward, it seems probable that the winter birds are typical *bewickii* and the summer birds *bairdi*. A change of residence on the part of the author prevented the exact determination of the matter. At Caddo, neither *Troglodytes aëdon* nor its western subspecies has been found. Mr. Lloyd states that Baird's Wren raises two broods in western Texas, where it is an abundant resident.

721. Troglodytes aëdon Vieill. [63.] *House Wren.*

The House Wren is a bird of the Eastern States, ranging west to the Mississippi Valley. In looking over the notes contributed on this species it has been found necessary to cut out 35 per cent. as being of uncertain identity. The House Wren is so commonly confounded with the Winter Wren that the records of its movements are perplexing and not very reliable. Information is needed concerning the northern limit of its winter range in the Southern States west of the Mississippi River. East of the Mississippi it is reported as regularly resident up to latitude 35°, and occasionally still farther north in heavy bottom lands. In migration, in the spring of 1884, it reached latitude 37° in Missouri the last week in March; latitude 38° 40′ in Missouri April 19; latitude 39° 19′ in Illinois April 25; and latitude 39° 12′ in Kansas April 24. After this the advance seems to have been very rapid, for the species arrived at latitude 46° 35′ in Minnesota May 3, and at Oak Point, Manitoba (latitude 50° 30′), near the limit of its northward journey, May 17. There is quite a strong intimation that the migration through eastern Illinois and Wisconsin took place from a week to ten days earlier than the movement in corresponding latitudes west of the Mississippi, but in the present uncertainty as to which species of Wren was actually seen no positive statement can be made.

In the fall of 1884 the bulk of House Wrens left Des Moines, Iowa, August 28, and none were seen there after that date. At Shawneetown, Ill., a single bird was reported as having been seen all winter.

In the spring of 1885 the records of the House Wren and the Winter Wren in migration were hopelessly mixed. The two Wrens appear to have migrated more nearly at the same time than usual, thus increasing the confusion of the records. All that can be safely said of the House Wren is that it was one month (from April 17 to May 17) in passing from Saint Louis, Mo. (latitude 38° 40′), to Oak Point Manitoba (latitude 50° 30′). The A. O. U. Check-list gives the habitat of the typical House Wren as "Eastern United States and Southern Canada, west to Indiana and Louisiana." The subspecies *parkmanii* is given as ranging in "Western North America, from Texas, Illinois, Minnesota, and Manitoba westward; north to Great Slave Lake, south to Jalapa, Mexico, and Lower California." According to these habitats, both of the localities mentioned, Saint Louis and Oak Point, belong to the western subspecies, and the same would be true of most of the records received under the name of the House Wren. It will be noticed that in the notes for 1884 it is said that there is an intimation that migration in Illinois and Wisconsin was a week or ten days earlier than that west of the Mississippi River. The same thing, in a still greater degree, appears in the notes for 1885. The records from eastern Illinois and Wisconsin, from such reliable observers as Mr. Balmer, Mr. Ingram, and a half dozen others, are fourteen days earlier than from corresponding latitudes in Missouri and Iowa. Now, if in these records for both years the House Wren and not the Winter Wren was the bird really seen, it follows that there is a clearly marked difference in the times of migration of the eastern and western House Wrens. To fully determine this point the records of the observers in the district east of the Mississippi Valley would have to be consulted and a careful series of observations made with reference to this particular point. The case is quite similar to that of the eastern and western Meadowlarks, and is well worthy of future consideration.

In the fall of 1885 the last House Wren was reported from Grinnell, Iowa, September 27; from Des Moines, Iowa, September 26, and from Saint Louis, Mo., September 29. The first one reached San Angelo, Tex· September 11. Dr. Agersborg states that both typical *T. aëdon* and *T. aëdon parkmanii* breed in southern Dakota.

721 a. **Troglodytes aëdon parkmanii** (Aud.). [63*a*.] *Western House Wren; Parkman's Wren.*

Parkman's Wren is a bird of the Western States, coming east to the Mississippi Valley. After what has been said of the eastern form but little remains to be said of the western. Its range in a north and south direction is about the same as the foregoing, and the dates of its migration are also much the same—possibly a little later. Concerning its eastward extension, it may be said to be common in western Texas, and it was found at Gainesville in north-central Texas in the spring of 1884. It is a common summer resident in Kansas, and is common in Nebraska, Dakota, western Minnesota, and western Manitoba. It has been taken several times at Chicago, Ill. Thus its course of migration is seen to tend somewhat in a northeasterly direction.

722. **Troglodytes hiemalis** Vieill. [65.] *Winter Wren.*

Breeds from the Northern States northward. Mr. H. A. Kline tells us that it nests in the rubbish along the banks of a stream one mile west of Polo, Ill., and Mr. Preston has found it as a not common breeder in central Iowa.

This Wren can endure cold many degrees below zero, and is found during the winter in much of the heavy timber south of latitude 39°. Most of the birds winter between latitude 34° and latitude 37°. In the spring of 1884 its migration took place a week or ten days earlier than in 1883. The migrants reached latitude 39° about March 20, and then paused until April 1. From April 5 to April 12 it spread over all the country north to latitude 45°. The last left Caddo, Ind. Ter., March 25; and Saint Louis, April 11.

In the fall of 1884 the first Winter Wren appeared at Mount Carmel, Mo., September 13.

After what has been said under the head of the House Wren, it is scarcely necessary to add that the records of the Winter Wren's movements during the spring of 1885 were largely confused with those of that species. All of the notes, with one exception, were very late, and this exception came from northeastern Illinois, and probably refers to the eastern House Wren.

In the fall of 1885 the only Winter Wren seen in fall migration at Elk River, Minn., was September 30. At Mount Carmel, Mo., one was seen October 10, while at Grinnell, Iowa, it was twice seen during the first week of November.

724. Cistothorus stellaris (Licht.). [68.] *Short-billed Marsh Wren.*

The Short-billed Marsh Wren breeds abundantly in western Manitoba, and occasionally throughout the southern part of its range, but in summer the bulk of the species is north of latitude 40°. Dr. Agersborg has recorded it as a rare breeder in southeastern Dakota.

In the Mississippi Valley it is not so common as the following species, and its winter home averages a little farther north. The notes indicate that it migrated about the same time as the Long-billed.

In the spring of 1885 the first and only Short billed Marsh Wren seen at Saint Louis was observed April 28. At Fernwood, Ill., the first was recorded May 10, and at Elk River, Minn., May 16.

In the fall of 1885 the last left Elk River, Minn., September 3. At Grinnell, Iowa, the first was seen October 22, and the last October 27.

725. Cistothorus palustris (Wils.). [67.] *Long-billed Marsh Wren.*

Occurs throughout the Mississippi Valley from Manitoba to the Gulf, wintering in the Southern States, and occasionally in mild winters even in southern Illinois. It is a late migrant. In the spring of 1884 it reached Ellis, Kans., April 27, where it is a rare summer resident. Nearer the Mississippi River it arrived somewhat earlier, but it did not advance to latitude 45° till the middle of May.

Few of the observers have noted this species, since its favorite haunts are in marshes, more or less inaccessible.

In the spring of 1885 Stoughton, Ill., was the only station that sent a report on the spring migration of the Long-billed Marsh Wren. It was first seen there May 12, and next May 14, at which date it became common. The species breeds throughout its range.

It is a rare spring migrant in western Texas (Lloyd).

In the fall of 1885 the first migrant appeared at Saint Louis, Mo., September 19, and the last was seen there October 6. At Emporia, Kans., the last was seen September 26.

726. Certhia familiaris americana (Bonap.). [55.] *Brown Creeper.*

Breeds chiefly along our northern border. The migratory movements of this species are peculiar. Dr. Coues says that it is "almost stationary," and yet there is probably no individual of the species that remains in the same latitude the whole year, while it is true that a few individuals may be found far north in winter and an equal number far south in summer. The bulk of the species migrates with more or less regularity. In 1883–'84 it was found wintering in Indian Territory, Missouri, Kansas, southern Wisconsin, and "very rarely" in southern Dakota. In previous years it has been found wintering up to latitude 45°, but beyond that point none of the Mississippi Valley observers have noted it in winter. During cold weather it remains among the heaviest timber, and hence would be seen by very few of the observers, but during its migration it can be found almost anywhere. From the fact that a few individuals wintered all along the Mississippi Valley, it is very difficult to trace its spring movements with accuracy. Dr. Coues implies that it breeds throughout its range, but instances of its breeding south of latitude 41° must be very rare. Indeed there is no such case recorded from the whole State of Illinois, and all observers south of latitude 41° agree in calling it either a winter resident or a transient visitor. Mr. T. M. Trippe, in a contribution on the "Birds of Colorado," which appeared in Coues's "Birds of the Northwest," stated (p. 230):

> Abundant during the winter, from 7,000 feet up to 9,000 feet, and probably ranging considerably higher and lower. Breeds sparingly in the upper woods, within a few hundred feet of timber-line. Appears at Idaho late in the fall, and becomes very common as soon as the weather becomes cold, great numbers coming in from other regions.

There seems to be little doubt that the bulk of the species breeds in the heavy forests along our northern boundary, and for a considerable distance beyond. The spring migration in 1884 began about the middle of March, and was at its height from April 10 to April 20, at which date the species was found migrating over all the northern half of the Mississippi Valley and in British America. It arrived at Oak Point, Manitoba, April 17. The migration was completed south of latitude 45° about the 1st of May.

In the fall of 1884 the Brown Creeper was reported as reaching Elk River, Minnesota, September 25, where it was last seen October 17. It was first reported from Des Moines, Iowa, November 8; and last from Mount Carmel, Mo., September 21.

In the spring of 1885 there was no regularity in the reports of the northward migration of the Brown Creeper. The records extend from April 1 at Saint Louis, Mo., to April 15 at Elk River, Minnesota. The last was seen at Saint Louis April 26, which is a later date than it was reported from any other station.

In the fall of 1885 the nine records of migration received were irregular. They indicate that the height of migration in the upper half of the Mississippi Valley was about October 1.

Mr. Lloyd states that in western Texas it is a "tolerably common winter visitor."

727. Sitta carolinensis Lath. [51.] *White-bellied Nuthatch.*

This non-migratory species belongs more particularly to the eastern two-thirds of the Mississippi Valley. The 97th meridian very nearly bounds its western range, and beyond this line it is only met with as a straggler. It has been found in western Kansas, and was reported from San Angelo, Tex., as "resident but rare." Only a few were seen at Caddo, Ind. Ter., and fewer still at Gainesville, Tex.

727a. Sitta carolinensis aculeata (Cass.). [51*a*.] *Slender-billed Nuthatch.*

This western form of the White-bellied Nuthatch is partially migratory. Mr. Seton (now Thompson) gave it as "a rather rare summer resident in western Manitoba." It occurs in the western part of our district, has been found in the timbered tracts of eastern Nebraska, and is a rare resident at Vermillion, in southeastern Dakota.

Mr. Lloyd found it to be the prevailing form at Fort Davis, Tex., while at San Angelo, Tex., only the eastern form was noted.

728. Sitta canadensis Linn. [52.] *Red-bellied Nuthatch.*

This is a truly migratory species, but our knowledge of its movements lacks precision. In the winter-time it is found throughout the district from the Gulf of Mexico to Minnesota. In summer the bulk passes beyond our northern border. It is rare in western Manitoba. It was reported in summer from Polo, in northern Illinois; and at Newton, in central Iowa, it was recorded as a resident.*

The few notes contributed upon its movements in the spring of 1884 indicate that its time of migration in the middle districts (between latitude 39° and latitude 42°) was during the last week in April and the first week in May.

In the spring of 1885 the first Red-bellied Nuthatch was reported from Paris, Ill., May 1. At La Porte City, Iowa, one was seen April 19.

729. Sitta pusilla Lath. [53.] *Brown-headed Nuthatch.*

A bird of the southern portion of the Mississippi Valley and eastward; resident throughout its range. The most northern record in 1884 came from Newport, Ark. (latitude 35° 36′), but it has been found by Mr. Widmann as an accidental visitor at Saint Louis, and has been recorded from Ohio.

730. Sitta pygmæa Vig. [54.] *Pygmy Nuthatch.*

An inhabitant of the western United States and the mountainous districts of Mexico. According to Professor Aughey it has been found once in northern Nebraska, where it must be a rare straggler.

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*I am of opinion that these records need verification.—C. H. M.

731. Parus bicolor Linn. [36.] *Tufted Titmouse.*

A common resident throughout the southern half of the Mississippi Valley east of the plains; abundant in eastern Kansas. If this bird performs any migration, it does so merely from the more open country, which it inhabits in summer, to the nearest heavy timber. In the late fall it is a most noisy bird, but in winter the struggle for food gives it no time for "petoing." With the first sign of spring, however, it begins with redoubled energy and keeps the woods full of its clear whistle until after the young have left the nest. In the Mississippi Valley it is not common north of southern Iowa, but has been known to wander to Minnesota. At Caddo, Ind. Ter., it began to leave the bottom-lands March 3, and by March 25 was spread evenly over the country.

Parus bicolor texensis Sennett. [—.] *Texan Tufted Titmouse.*

An inhabitant of southern Texas. (For a description of this new Tit see the Auk, vol. iv, No. 1, Jan., 1887, pp. 29–30.)

732. Parus atricristatus Cass. [37.] *Black-crested Titmouse.*

Dr. Coues, in his "Birds of the Colorado Valley," says of this species: "Habitat, Valley of the Rio Grande and southward in Mexico, (p. 116). But the same year (1878) Mr. Ragsdale determined its range in the United States to be south from latitude 33° and west from longitude 98° 30′. Mr. Lloyd has ascertained that it is a tolerably common resident in Concho and Tom Green Counties, Tex., and thence to El Paso is the prevailing species. In April, 1878, its eggs were taken in Comal County, Tex., by Mr. W. H. Werden (Bull. Nutt. Ornith. Club, vol. IV, 1879, p. 76); and Mr. N. C. Brown found it "a very abundant resident" at Boerne, Texas, in 1880. (*Ibid.*, vol. VII, 1882, p. 35.) It is an abundant resident along the Lower Rio Grande (Merrill; Sennett).

Parus atricristatus castaneifrons Sennett. [—.] *Chestnut-fronted Titmouse.*

This new subspecies has been recently described by Mr. Sennett, from specimens taken in Bee County, in southern Texas (Auk, vol. iv, No. 1, Jan., 1887, pp. 28–29).

734. Parus wollweberi (Bonap.). [39.] *Bridled Titmouse.*

The home of the Bridled Tit is in western Texas and thence westward.

735. Parus atricapillus Linn. [41.] *Black-capped Chickadee.*

This Chickadee is found in the United States from western Iowa and eastern Kansas eastward, and from southern Illinois northward. It has been claimed that it is not stationary, as has been generally supposed, but that there is a migratory movement each fall and spring, so that the species is not represented in winter at any station by the same individuals which are found there in summer. Very little material has ever been collected for the settlement of this point, and the field would be a fruitful one for some patient and painstaking observer. The only light furnished on the subject, by the record of 1884, came from Saint

Louis, where transient individuals were seen passing from March 20 to March 26.* Mr. Lloyd took one in spring migration in eastern Concho County, Tex.

735a. Parus atricapillus septentrionalis (Harris). [41*a.*] *Long-tailed Chickadee.*

This is the western form of the preceding, and similar to it in habits. It is found as far east as Missouri, eastern Nebraska, and western Minnesota along the Red River, thus slightly overlapping the home of the Black-cap. Dr. Agersborg states that it is the only Chickadee found in southeastern Dakota, and Colonel Goss says it is common in western Kansas. In the South it has been found in Texas, where it was mixed with the southern Chickadee. Professor Lantz took a fine set of seven eggs April 17, at Manhattan, Kans., and the next day a set of the eggs of the Eastern form.

736. Parus carolinensis Aud. [42.] *Carolina Chickadee.*

This is a Southern species, and is supposed to be a resident throughout its range, which extends southward from southern Illinois and central Missouri. It thus overlaps the range of the Black-capped Chickadee, and in southwestern Missouri (for example, at Pierce City) all three forms are found. In Concho County, Tex., Mr. Lloyd found it once in winter, and once in spring migration. It was previously ascertained to be a resident in Comal County, Tex. (Bull. Nutt. Ornith. Club, vol. IV, 1879, p. 76); and is a common resident in eastern Texas (Nehrling).

740. Parus hudsonicus Forst. [45.] *Hudsonian Chickadee.*

Breeds in British America and is a rare visitant to the northern parts of our district. It has been recorded from Illinois, Wisconsin, and Michigan.

744. Psaltriparus plumbeus Baird. [48.] *Lead-colored Bush-Tit.*

Mr. William Lloyd has ascertained that this western Tit ranges east to our district. He saw an erratic flock of about twenty individuals at Fort Davis, Tex., during November, 1885.

746. Auriparus flaviceps (Sund.). [50.] *Verdin; Yellow-headed Tit.*

The Verdin or Yellow-headed Tit has been known for years as a resident of southern Texas. Its range extends from the valley of the lower Rio Grande westward to Lower California, and south to northern Mexico. One of our observers, Mr. H. P. Attwater, has studied its habits at a place near the extreme northeastern limit of its range. He found it resident and quite common at San Antonio, Tex. (lat. 29° 27′), where, during the summer of 1884, his party obtained about thirty skins and quite a number of nests and eggs. The nest, which is so large as to be out of all proportion to the size of the bird, is occupied all winter as a sleeping place. In journeying from San Antonio southwestward to the Rio Grande River, Mr. Attwater found these birds not numerous, but evenly distributed over all the country.

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* There is no question whatever that this Chickadee is a migrant, however, limited its migrations may be. In the District of Columbia and neighboring portions of Maryland and Virginia it is a winter visitant, never remaining to breed.—C. H. M.

748. **Regulus satrapa** Licht. [33.] *Golden-crowned Kinglet.*

A migrant in the Mississippi Valley, possibly a few breed in northern Minnesota. This species is much less numerous than the Ruby-crowned Kinglet, and is seldom seen in real flocks. It is, however, a much hardier bird, and winters over most of the United States south of latitude 40°, and a little farther north in the mountainous portions of the East. This of course means in suitable localities, which are heavily wooded valleys. Unlike the Ruby-crowned Kinglet, it is most numerous in the middle portion of its winter habitat, but few going as far south as the Gulf. Still Mr. Lloyd tells us that a few winter in Concho County, Tex., and that it is tolerably common there in fall migration. In southeastern Texas it is common in winter (Nehrling). The van does not start northward many days in advance of the Ruby-crowns, but the transit of the bulk is much quicker, and the last Golden-crown usually leaves a locality before the other species even becomes common. Leaving out of account the very few individuals which wintered there in 1883-'84, the first migrants arrived at latitude 39° about April 1, and at latitude 45° about the middle of the month. The last left Texas before March 20, and a month later there were none to be found south of latitude 40°. Mr. Kline states that a few remain all summer in the thick swamps near Polo, Ill. (lat. 41° 58′), but that he has never succeeded in finding their nests.

In the spring of 1885 a Golden-crowned Kinglet was shot at Gainesville, Tex., March 24. A bird, probably this species, had also been seen there three days earlier. At Paris, Ill., the first was seen March 30; at Saint Louis, Mo., March 31; Chicago, Ill., April 1; Delavan, Wis., April 2; Grinnell, Iowa, April 7; Ripon, Wis., April 10; and New Richmond, Wis., April 14. The records of "lasts" were very irregular. The latest was May 13, at Durand, Wis.

In the fall of 1886 the record was quite regular. "Firsts" were seen at Lanesboro, Minn., October 2; Iowa City, Iowa, October 3; Milwaukee, Wis., October 4, and Saint Louis, Mo., October 14. The last at Lanesboro were seen October 18; at Milwaukee, October 26, and at Saint Louis, October 31.

749. **Regulus calendula** (Linn.). [30.] *Ruby-crowned Kinglet.*

Breeds chiefly north of the United States, and winters from near our southern border southward. At one station only, namely, San Angelo, Tex. (latitude 31° 22′), was this species reported as a winter resident in 1883-'84. Careful search might have revealed it at a dozen more stations, for it has been known to winter in Kansas and in southern Illinois. At Caddo, Ind. Ter., the most diligent search failed to discover a single individual, although the Golden-crowned Kinglet was common. Mr. Lloyd states that the Nueces cañon, in southwestern Texas, is the winter home of countless myriads of these birds, and that they leave very early in the spring, none having been seen after March 9, 1884. At Caddo, Ind. Ter., about a hundred were seen March 25, showing that the first came a few days before. Farther east the migration began about the middle of March, and proceeded without much regularity. April 1 found the birds at about latitude 39°, with a few stragglers a little beyond. Then the records become irregular, as if the small size of the birds allowed them to escape the notice of about half the observers until some days after their arrival. Perhaps the notes on the migration of this species will give a fair idea of the returns made by observers with reference to many of the smaller birds. From latitude 40° to latitude 41° 59′ the dates of arrival are: April 19, 21; March 30, 31; April 17, 15, 20; from latitude 42° to latitude 43° 59′: April 22, 27, 17, 5, 10, May 8; from latitude 44° to latitude 45° 59′: April 12, 21, May 11. Much of this apparent confusion can be explained by the differences in altitude and situation of the stations, while the opportunities and experience of the observer must also be taken into account. The normal arrival of the species at latitude 42° appears to have been about April 15, and at latitude 45° April 20. May 5 it arrived at Portage la Prairie, Manitoba.

Many of the observers were deceived in regard to the time of arrival of the bulk of this species. It is true that the first arrival often consists of many individuals, and that others come within a day or two, so that the species appears to be common; but the arrival of the great multitude, the real bulk, does not take place till two or three weeks later. If at that time one of its favorite haunts is visited it is found everywhere. Though scarcely breeding south of latitude 45° in the Mississippi Valley, yet it was found in Texas as late as May 1, and in the middle districts even on May 15. On the plains, as usual, it was later in migrating, reaching Manhattan, Kans., April 30, and Vermillion, Dak., May 8.

In the fall of 1884, Ruby-crowned Kinglets first appeared at Des Moines, Iowa, September 27, and for the next two days were common; they then left as suddenly as they had come. They were reported as arriving at San Angelo, Tex., October 8.

In the spring of 1885 the earliest record came from San Antonio, Tex., February 26, and the next from Gainesville, Tex., March 31. Saint Louis, Mo., was reached April 1; Paris, Ill., April 4; Mount Carmel, Mo., April 5; Iowa City, Iowa, April 6; Grinnell, Iowa, April 6; and Lanesboro, Minn., April 9. Then there seems to have been a long pause, for nearly two weeks passed before any other records were made, and these later notes were too irregular for use. At Saint Louis, Mo., the bulk was present from April 17 to April 20, and the last was seen May 5. "Lasts" were reported from Manhattan, Kans., May 6; Des Moines, Iowa, May 8; Mount Carmel, Mo., May 10; Grinnell, Iowa, May 9; Williamstown, Iowa, May 5; Waukon, Iowa, May 12; Durand, Wis., May 13; while on May 16 about two hundred Ruby-crowns were seen at White Earth, Minn.

In the fall of 1885 the record was more regular than that for the spring migration. "Firsts" were seen September 27 at Grinnell, Iowa, and Mount Carmel, Mo. At Saint Louis, Mo., the first was seen October 5; at Emporia, Kans., October 6; at Bonham, Tex., October 14, and at San Angelo, Tex., October 17. "Lasts" were reported at Grinnell, Iowa, October 10; Iowa City, Iowa, October 10, and Mount Carmel, Mo., October 12. At Saint Louis, Mo., where they were most numerous October 10 and 11, the last was seen October 23.

751. Polioptila cærulea (Linn.). [27.] *Blue-Gray Gnatcatcher.*

The southern half of the Mississippi Valley is the summer home of this species, and a few may linger in winter on our extreme southern border, but the bulk deserts the United States for a warmer climate. They have been known to occur in Minnesota, but very rarely. The most northern record received in 1884 was from Laporte City, Iowa (lat. 42° 18′). Their dispersion in the West is a little peculiar. In Kansas all the observers gave them as common in migration, but few remaining to breed, while in Nebraska they were considered rather rare. Where, then, do these abundant migrants breed?

Returning, it enters the eastern part of the Mississippi Valley in early March, but in western Texas is somewhat later. In the spring of 1884 it was seen at latitude 35° April 1, and the middle of the month at latitude 39°. The fact that these birds were near their journey's end did not occasion any decrease in their speed, for they pushed right on, and in a few days (by April 28) had reached the limit of their northward journey in northern Illinois and central Iowa.

In Texas there is a decided difference between their migration in the eastern and western parts of the State. At Gainesville, Tex., they appeared March 22, and more than a hundred were seen at Caddo, Ind. Ter., March 25. These two stations are near the valley of the Red River. Much farther south, in western Texas, they appeared later, arriving at San Angelo and Mason April 6 and 7. In the northern part of their range the species may be considered as having completed its migration and settled down to summer work about May 10.

In the fall of 1884 the bulk of Blue-gray Gnatcatchers was reported as leaving Des Moines, Iowa, August 26, and the last, three days later. The last was reported from Mount Carmel, Mo., September 6, and from San Angelo, Tex., October 5.

In the spring of 1885 it arrived at San Angelo, Tex., March 15; Gainesville, Tex., March 23; Houma, La., March 31; Corinth, Miss., April 7, and Saint Louis, Mo., April 8. An early migrant was seen at Peoria, Ill., April 13. The bulk reached Saint Louis, Mo., April 17, and the first was reported from Paris, Ill., the same day. April 18 they were seen at Emporia and Manhattan, in Kansas. Between April 20 and April 23, they appeared at Des Moines, Newton, and Grinnell, in Iowa. At New Richmond, Wis., a locality far north of the usual range of the species, it was reported May 18.

In the fall of 1885 the last was seen at Grinnell, Iowa, September 26; and at Saint Louis, Mo., September 25. None were seen at Bonham, Tex., after September 1.

752. Polioptila plumbea Baird. [28.] *Plumbeous Gnatcatcher.*

The home of this Gnatcatcher is in southern Texas and thence westward to Lower California.

754. Myadestes townsendii (Aud.). [25.] *Townsend's Solitaire.*

A rare stranger from the western United States. The only accounts of it in the Mississippi district refer to its occasional occurrence in winter. Prof. Aughey saw one on the Niobrara River in Nebraska, in 1877; January 17, 1880, Mr. Powell took a fine male at Alda, Nebr.; and later Mr. Hall saw it in southeastern Nebraska. Col. N. S. Goss gives it as "an occasional fall and winter visitant in western Kansas," where he saw ten and killed four in October, 1883. One was killed at Waukegan, Ill., December 16, 1875 (Nelson). Some of the most important of Mr. Lloyd's many ornithological discoveries in western Texas refer to Townsend's Solitaire. He not only determined its occurrence there in winter, by securing three specimens, but in May, 1886, he found its nest at Saragossa. It breeds in the Black Hills of Dakota.

755. Turdus mustelinus Gmel. [1.] *Wood Thrush.*

The several Wood Thrushes (members of the subgenus *Hylocichla*) are so commonly and constantly confounded with one another by all but the practiced ornithologist, that no more hopeless task is encountered in the whole study of migration than that of attempting to determine which species were actually seen by each observer. Many notes, believed by the observers to relate to the present species, evidently refer to the Hermit Thrush (*Turdus pallasii*), which is the earliest member of this group to migrate, and in other cases it is probable that the bird actually seen was the Olive-backed Thrush (*Turdus. swainsonii*). The Wood Thrush is a common breeder in the middle belt of the Mississippi Valley. It becomes rare toward our northern boundary. The first authentic record of the Wood Thrush in 1884 came from Saint Louis, Mo., where a single one was noted April 19. It was not seen again for a week, but April 26 the bulk of males appeared at Saint Louis, and soon after it began to be reported from more northern points. On the last day of April it was noted in latitude 39° 19′ in Illinois, latitude 38° 45′ in Missouri, and latitude 39° 12′ in Kansas, showing that on that date the line of advance was pretty nearly coincident with the 39th parallel. The normal advance seems to have reached latitude 41° May 5, and the territory between latitude 42° and latitude 43° May 7 and 8. In Wisconsin it was observed at latitude 43° 43′ May 12, but in Minnesota at about the same latitude none were seen until May

17. There are other records from farther north, but it seems probable that they belong to the Hermit Thrush. It was reported by Mr. Nash from Portage la Prairie, Manitoba, though it is very scarce in that region. The records are too indefinite to admit of tracing the movements of the bulk. The species breeds throughout its range in the district, and winters beyond our border. Dr. Agersborg states that it is a rare summer resident in southeastern Dakota, and Colonel Goss records it as abundant in eastern Kansas.

In the fall of 1884, at Des Moines, Iowa, the last Wood Thrush was seen August 25. At Mount Carmel, Mo., the bulk left September 1, and the last was seen September 14.

In the spring of 1885 the following complete records of the movements of the four species of Thrushes most commonly confounded were received, and may be of use as a table of reference.

Mr. Widmann's record at Saint Louis was as follows:

Hermit Thrush. First, April 1; bulk present from April 6 to April 18; last, April 24.

Olive-backed Thrush. First, April 17; bulk present from May 4 to May 6; last, May 20.

Wilson's Thrush. First, April 22; bulk present from May 5 to May 12; last, May 12.

Wood Thrush. First, April 19; bulk came April 28; remains to breed.

In the spring of 1884 the movements of these species at Saint Louis were as follows:

Hermit Thrush. First, April 1; bulk present from April 14 to April 19; last, April 28.

Olive-backed Thrush. First, April 26; bulk present from April 29 to May 12; last, May 26.

Wilson's Thrush. First, April 29; never common; last, May 21.

Wood Thrush. First, April 19; bulk came April 26.

In the spring of 1883 the record was:

Hermit Thrush. First not noted; bulk present April 10 to April 12; last, April 13.

Olive-backed Thrush. First, April 26; bulk present from May 2 to May 18; last, May 24.

Wilson's Thrush. First not noted; bulk present from May 15 to May 17· last, May 21.

At Jefferson, Wis., in the spring of 1883, I made the following record:

Hermit Thrush. First, April 4; bulk present from April 20 to May 6; last, May 10.

Olive-backed Thrush. Second seen May 3; bulk present from May 12 to May 24; last, May 31.

Wilson's Thrush. First, May 7; bulk present from May 12 to May 24; last, May 30.

Wood Thrush. First, May 10; bulk came May 17.

These are the only complete records received. From them it will be seen that although the exact dates are somewhat variable, the *relative* movements of the first three species remain the same for the three years and in the two widely separated localities, while the Wood Thrush shows great constancy in the time of its arrival at Saint Louis, without regard to the weather.

The records of the migration of the Wood Thrush in the spring of 1885 fell between April 19, at Saint Louis, Mo., and May 18, at Lanesboro, Minn.

In the fall of 1885, at Grinnell, Iowa, the last was seen September 16, and at Saint Louis, Mo., September 26.

756. Turdus fuscescens Steph. [2.] *Wilson's Thrush.*

This is rather a retired bird and one not often noticed in its late and hurried migration. It winters principally south of the United States, though a few stay in the Gulf States and Florida; hence it has a long journey to perform before reaching its breeding grounds in the northern United States and British America. In the spring of 1884 few records were made of its movements, and none whatever of its first appearance along our southern border. No notes were contributed from any locality south of Saint Louis, Mo., where two birds arrived April 29. Four birds, the highest number seen in one day, were recorded May 17, and May 21 the last one left, but managed to sing a little before its departure. A little farther up the river, at Burlington, Iowa, the first was noticed May 5, though one had been seen at Chicago, Ill., two days previously. May 11 and May 12 it reached West De Pere, Wis., and Lanesboro, Minn. A week later (May 18) it reached Oak Point, Manitoba. It breeds abundantly in Manitoba and occasionally in the Northern States, sometimes as far south as northern Illinois and Iowa. Mr. Kline took two sets of eggs at Polo, Ill., during the season of 1883; Dr. Agersborg has found it breeding at Vermillion, in southeastern Dakota, and its nest and eggs have been taken at Grinnell, Iowa.

In the spring of 1885 the notes on Wilson's Thrush were more regular than those on the other species of Wood Thrushes. At Saint Louis, Mo., and Paris, Ill., the first were reported April 22. From May 5 to May 9 they were noted at Mount Carmel, Mo., Iowa City, Iowa, Grinnell, Iowa, Lanesboro and Lake City, Minn., and Durand, Wis. May 13 they appeared at River Falls, Wis., and May 16 I saw a single bird near White Earth, Minn.

756 a. Turdus fuscescens salicicolus (Ridgw.). [—]. *Willow Thrush.*

This western form of Wilson's Thrush was described by Mr. Ridgway from the Rocky Mountain region of the United States. It was taken by Coues on the Souris River, along our northern boundary, and an accidental straggler came to Chicago, Ill., where it was taken September 16, 1877, by Mr. H. K. Coale. The specimen was identified by Mr. Ridgway. Recently it has been killed in Cook County, Tex., by Mr. Ragsdale. Specimens were taken at Devil's Lake and Pembina, Dak., by Mr. Vernon Bailey, in the summer of 1887.

757. Turdus aliciæ Baird. [3.] *Gray-cheeked Thrush.*

Alice's Thrush winters south and breeds north of our borders. But few notes were contributed on its movements, because few observers distinguish it from the Olive-backed Thrush. It is a common migrant in western Manitoba. The records received for 1884 can not be considered as very trustworthy since they give its appearance at about the same date (May 7 and May 8) over the region from latitude 38° 40′, in Missouri, to latitude 42° 56′, in Dakota, and latitude 44° 32′, in Minnesota. At Saint Louis the record reads: May 7, first; May 16, bulk; May 25, last. Thus its transit was more rapid than that of the Olive-backed, which arrived earlier and remained later.

In the spring of 1885 the Gray-cheeked Thrush was first seen at Gainesville, Tex., May 9. At Saint Louis, Mo., the first was seen April 24, and the last May 25. At Paris, Ill., it was first seen April 15; at Des Moines, Iowa, May 8 (where it remained only three days); and at Lanesboro, Minn., May 15. In Kansas it is a rare migrant (Goss).

758 a. Turdus ustulatus swainsonii (Caban.). [4*a.*] *Olive-backed Thrush.*

A tolerably common summer resident from Manitoba northward. In tracing this species along the three routes of migration in the Mississippi Valley, it is found that the most eastern is the earliest and the most western the latest. In the spring of 1884, at Danville, Ill., the first came April 25, and it passed north to latitude 41° 57′ as early at least as April 28. Along the middle route, just west of the Mississippi River, the first was reported from latitude 38° 40′, in Missouri, April 26, and the bulk April 29. Farther up the river, they came to latitude 43° 43′, in Minnesota, May 10, and to Minneapolis (lat. 45°) May 17. Farther west, the bulk came to Manhattan, Kans. (lat. 39° 12′), May 13, were abundant for two days, and then suddenly disappeared. Mr. Widmann furnished a very full record from Saint Louis, which is as follows:

> April 26, first; April 29, bulk arrived (small dark birds); May 5, height of the season (song often heard, the birds chasing each other as if mating); May 9, bulk continued present, dark birds; May 11, arrival of great numbers (lighter birds, probably one year old); May 13, the bulk of the species departed; May 26, last.

This species winters south of our border, and breeds principally in British America, but occasionally has been found nesting as far south as northern Illinois. At Grinnell, Iowa, its nest and eggs have been taken, and toward the latter part of the season the young are frequently seen with the parents.

In the spring of 1885 but few notes were contributed concerning the movements of the Olive-backed Thrush. The whole record from Saint Louis is as follows: "First, April 17; second, April 20; increase, April 22; arrival of bulk, May 4; most numerous, May 5; departure of bulk, May 6; last, May 20." At Gainesville, Tex., the last was seen May 19, At Manhattan, Kans., the first was seen May 12 and the last May 16. At White Earth, Minn., May 16, I saw about thirty of these birds.

In the fall of 1885 the first were reported from River Falls, Wis., September 5. It is a rare fall migrant in Tom Green County, Tex. (Lloyd).

759. Turdus aonalaschkæ Gmel. [5.] *Dwarf Hermit Thrush.*

The true home of the Dwarf Hermit Thrush is in the Pacific coast region. During migration it passes east to Nevada and Arizona, and recently Mr. Lloyd has discovered it in Concho and Tom Green Counties, Tex., where it is a tolerably common fall migrant. He states that he has seen it every day from September 20 to October 10.

759 a. Turdus aonalaschkæ auduboni (Baird). [*5a.*] *Rocky Mountain Hermit Thrush.*

This western species was first found within our district by Mr. N. C. Brown, who procured it at Boerne, Tex. More recently Mr. Lloyd has taken two specimens at San Angelo, Tex., and Mr. Ragsdale has extended its range by securing specimens at Gainesville, Tex.

Mr. Lloyd's later researches have determined that this form winters near San Angelo, and that it is a tolerably common spring migrant in Tom Green County, Tex. At Gainesville, the first was seen March 20.

759 b. Turdus aonalaschkæ pallasii (Caban.). [*5b.*] *Hermit Thrush.*

A common migrant in the Mississippi Valley, breeding in the northern and wintering in the southern part. The cold of winter has less effect upon this species than upon any of its brethren. It does not mind moderate cold, but dislikes snow and usually manages to keep just south of the line where snow remains on the ground for weeks at a time. Sometimes, of course, it is caught in a snow-storm, but when this happens it seeks a thick covert and endures it. The heavy undergrowth of the Mississippi bottom lands in southern Illinois offers a favorite wintering place for Hermit Thrushes, but the extreme weather of January, 1884, proved too severe for them and they left for a warmer climate. At Caddo, Ind. Ter., they remained the whole winter, but their habits were peculiar. In the May-day of their lives at the North they are shy, restless birds, ever watching for a tempting morsel, or from a low branch uttering their clear, liquid, and far-reaching notes. But in winter, in Indian Territory, they acted as if life was a burden; insensible to their surroundings, they sat stupid and silent except for a short unmusical "chick," and allowed one to approach within a few feet; if disturbed they moved but a short distance. The bulk of the species began to come from the south in the early part of March, but it is impossible to trace their movements from the notes contributed by observers. No bird has a more mixed and contradictory record, to say nothing of the many times it is confounded with the Brown Thrush and the Olive-backed. It is probable that the larger part of the notes are true, and indicate that the species is very erratic in its northward journey. The facts seem to show that during the great migration movements of the latter half of March, single individuals were scattered over much of the Mississippi Valley to latitude 44°. But these individuals must be considered as forerunners, for the regular occupation of this territory did not take place till nearly a month later. The regular migration began April 1, at latitude 39°, and by the beginning of May had advanced irregularly to latitude 45°. During the last week of April and the first part of May, the last of these birds left the lower part of this territory and soon reached their breeding grounds. Comparatively few instances have been recorded of the breeding of the Hermit Thrush within the Mississippi Valley. Outside of the mountains of Colorado the most southern breeding point on record is Alda, Nebr. (Lat. 40° 53′), from which place Mr. F. W. Powell writes that he found no nest, but saw the old birds feeding young which were too small to fly. At Grinnell, Iowa, the nest was found and identified by seeing the bird upon it. The nest and eggs are now in the Iowa College at Grinnell. At Des Moines, Iowa, they have been seen in the breeding season, but no nest has been found.

In the spring of 1885 Hermit Thrushes came to Saint Louis, Mo., the 1st day of April, and during the rest of the week were noted from Paris, Aledo, and Chicago, Ill. Another advance took place April 15 to April 18, bringing them to Newton, Iowa, and Grinnell, Iowa, Hennepin, Ill., and Clinton, Wis. North of these places the records were unsatisfactory. The only "lasts" reported were from Saint Louis, April 24, and Chicago, May 5.

In the fall of 1885 the first was observed at Saint Louis, Mo., October 5; the bulk was present October 9; and the last was seen October 11. At Lanesboro, Minn., the last was noted October 10.

In the eastern part of Concho County, Tex., Mr. Lloyd took one in spring migration.

761. Merula migratoria (Linn.). [7.] *American Robin.*

The Robin is a common summer resident in Manitoba and throughout the Mississippi Valley except in the extreme southern portion. In winter it is abundant in Louisiana and in eastern and southern Texas, it also winters irregularly over most of its United States range. It seems to be the best known bird in the Mississippi Valley, and many more notes were contributed on it than on any other species. It should be possible, therefore, to determine its movements with considerable accuracy. All through December, 1883, it was found in abundance throughout southern Illinois, Missouri, and Kansas, but the extreme cold of the first week in January, 1884, drove it farther south into its real winter home. During the larger part of this month the bulk of the Robins (probably even 90 per cent. of them) were south of the parallel of 37°. This is south of the usual winter limit of the species, the northern boundary for ordinary winters being about latitude 39°. It must not be supposed, however, that Robins never spend the winter farther north. The fact has been repeatedly demonstrated that nature has bestowed on them strong constitutions, so that if food is plenty they can withstand severe cold. Every year some of the northern observers report Robins wintering about their stations, and the winter of 1883-'84 was no exception. One was seen, January 1, in northwestern Indiana; another, January 11, at Vermillion, Dak., and finally, at Hastings, Minn., 500 miles from his brethren, "one was seen December 28, 1883, with a flock of Pine Grosbeaks (*Pinicola enucleator*), apparently at home and determined to spend the winter. It was seen repeatedly, and actually remained till spring with the same flock of Grosbeaks."

The distribution of the Robin in its winter home depends entirely on the food supply; where food is plenty, there the Robin remains, though observers a few miles away may not see one all winter. At Manhattan, Kans., berries are abundant, and during the winter of 1883-'84. as in previous years, flocks of five hundred or more individuals were constantly seen, while observers at stations but a short distance away reported no Robins from December until February. Manhattan, Kans., is the most northern station at which *flocks* of Robins remained during the winter. So far as can be learned, but few wintered in Indian Territory, nor did northern Texas fare much better; but they were reported as wintering in immense numbers along 300 miles of the cañon of the Nueces River in southwestern Texas. In Concho and Tom Green Counties Mr. Lloyd states that they are tolerably common in spring and fall, and that a few winter in the river bottoms. They were reported from all the Southern States, at some points as abundant, at others as rare.

In the early spring of 1884, as if disliking winter quarters, the Robins pushed north at the first breath of warm weather. Regardless of the certainty of being overtaken by cold, they hurried on, and from January 31 to February 3 occupied all the country from which they had been driven by the low temperature of the first of the year. This movement was confined to comparatively few individuals, and while the scouts had advanced to latitude 39°, or even a little farther north—single birds having been seen at Burlington, Iowa, (lat. 40° 50′) and at Lake Mills, Wis. (lat. 43° 06′)—the main body still remained in camp three or four hundred miles to the south. Then followed a whole month of waiting, during which time adventurous birds pressed northward, only to be driven back by snow and ice; nor was the real advance commenced until March 9. From that date until they had passed our northern boundary their advance was constant and more or less uniform. The regular advance of the van appears to have been as follows: From March 9 to 15 they spread over Illinois and eastern Nebraska to latitude 41° 51′; March 16, there was a slight advance in Iowa; March 17 and 18, no record; March 19 and 20 an advance to latitude 43° in Iowa, Illinois, and Wisconsin, but not in Nebraska; March 21, a sudden spreading over Wisconsin to latitude 45°.

By March 24 the rest of the stations in Wisconsin had reported, and an equal advance had taken place in Minnesota, so that by this date the van was at latitude 45° along the whole line. North of this all the stations are in the valley of the Red River of the North. In this valley the first arrivals reached latitude 47° April 3, and just one week later appeared at Oak Point, Manitoba (lat. 50° 30′). The fact that the spring migration on the Western plains in 1884 was several days behind the migration in the same latitude farther east is clearly shown by the record of the Robin. At Ellis, Kans. (lat. 38° 55′), the first arrived March 21, but in Illinois it reached that latitude six weeks earlier. At Menoken, Dak. (lat. 46° 58′), it did not arrive until April 29, while at Frazee City, Minn. (lat. 46° 33′), it arrived April 3; and at Larimore, Dak. (lat. 47° 52′), the high, bleak situation answers to a western position, and the Robins did not come until April 21.

The bulk of the species traveled much behind these advance guards in the lower part of the course, but moving faster than the scouts, by the time it reached the end of the march was but a few days in the rear. The bulk reached latitude 39° between March 12 and 17; then moved to latitude 43° March 23 and 24; to latitude 45° 30′ by March 27 and 28; to latitude 47° April 5, and to Portage la Prairie, Manitoba, April 20. From the few scattering notes on the subject, we may guess that the bulk left latitude 35° March 7, latitude 37° March 25, latitude 39° March 31, and latitude 41° April 10. By the middle of April, in all the country south of latitude 43°, all Robins had left those places where they did not intend to breed, and at the other places had settled down to summer numbers. This is true not only of the Robin, but also of all those species whose records are sufficiently voluminous to afford a fair guide to their movements. This overtaking of the van by the rear may be explained in either of two ways, and it is probable that both causes have some effect. The individuals forming the van always consist of old birds, and these arriving at the place where they nested the previous year stop to breed, leaving the advance to be made by those behind, giving the main body a chance to come close to the van; and, secondly, while the van is being constantly retarded by storms and cold, the rear travels in more settled weather and would naturally move faster.

In the fall of 1884 the bulk of Robins left Elk River, Minn., September 27, and the last was seen there November 7. At Hastings, Minn., none were seen after September 29. At Des Moines, Iowa, the bulk was recorded as leaving October 25, and at Mount Carmel, Mo., October 15. As already noted, many straggling Robins remain during the winter in sheltered localities much farther north than the regular winter home of the species. At Manhattan, Kans., during the winter of 1884–'85, they were as abundant as usual, while a few were noted at various points for the next 200 miles southward. A single bird was seen at Morning Sun, Iowa, February 6. One remained at Newton, Iowa, all winter; at La Porte City, Iowa, they were common all winter, and even as far north as Hastings, Minn., 400 miles beyond its ordinary winter range, two birds were seen February 27. These may have been migrants a month ahead of their fellows (the next individuals of which were seen April 1), but it is more probable that they had wintered in that vicinity, as the neighboring bluffs along the Mississippi River furnish numerous well-sheltered spots, suitable for winter quarters. Mr. Alexander Scougal, of Sioux City, Iowa, sent the following interesting note:

> Among our winter birds there is one in particular which I wish to mention. It is the male Robin. Hardly a person will believe that there is a Robin in the State during the winter; but on December 23, 1883, I shot a male Robin but took no particular notice of it except to skin it. Last December (1884), during the holidays, I took my gun and started for a dense thicket, almost impenetrable by man or dog. There I saw a number of Robins, and shot three. One of them was wing-tipped and when caught began to call, and immediately there were thirty-four Robins sitting around me, making noise enough to deafen one. I held the one in my hand for a long time so I could look at the rest; all of them were male birds; not a female could be seen. I found a house in the woods and asked the man about them. He informed me that they had been there all winter, but he was not able to distinguish males from females. I can not say positively that the female does not stay here in the winter, but I never have seen one nor heard of any here during that season; so I think it must be rarely if ever seen. The day I saw the birds was December 27, and the temperature was 20° below zero. Again, January 2, 1885, I was there and saw the Robins a second time; it was then 17° below zero. I found in their stomachs wild grapes and seeds from a small bush (probably *Symphoricarpus*). The trees in that part of the woods were covered to their top with grape-vines, and many other vines grew underneath. The birds were in good condition, and seemed as lively as in midsummer. Hence it would seem that these old birds, being the last to migrate, do not go so far south as the rest of their species, but get into these dense thickets and are unnoticed by most people, until with the first warm weather they fly out into the open fields. The first day or two of February were warm, the mercury rising to 46° above zero, and these Robins were seen by a good many people in the city. A cry went around, "Spring is coming, we have seen a Robin." But February 5 cold weather returned, and now (February 16) the thermometer ranges from eight to fourteen degrees below zero. The people wonder where the Robins have gone, but if they would go to the dense thickets of Walker's Island, on the Nebraska side of the river, they could find the same Robins as lively as ever.

The same warm wave of February 2, just spoken of by Mr. Scougal, caused Robins to appear at Vermillion, Dak., a few miles northwest of Sioux City. A large flock was seen at the same place February 7. From points south of latitude 38° records of "firsts" can hardly be taken as necessarily indicating northward migration; but the dates given when the Robins became common show when the general northward movement began.

In the spring of 1885 true migration seems to have commenced during the last two days of February and the first two days of March. Robins were not marked "common" before March 3 at any station north of latitude 39° with the exception of Glasgow, Mo., where they were so recorded February 25. Out of about twenty species of the most common birds which had been studied before this bird was taken up, there was not one whose record could compare in irregularity with that of the Robin. It is utterly impossible to find any regular movement from the notes for the first three weeks in March. It may be supposed that something like this occurred: That during the first week of March the van moved from latitude 39° to latitude 41°, in Missouri, Illinois, Iowa, and Nebraska; that during the next two weeks of cold, freezing weather, little, if any, general advance was made, but that enough adventurous birds pressed forward to thoroughly confuse the record. During the two weeks from March 7 to 21, most of the Robins abandoned winter quarters and appeared in new localities, which caused them to be recorded as common throughout the Mississippi Valley south of the parallel of 39°. On the night of March 21 the weather began to moderate and the following records of "firsts" were made during the progress of the warm wave which followed: Robins were reported at Chicago, Ill., and Milwaukee, Wis., March 22; Delavan, Wis., and Waukon, Iowa, March 23; Stoughton and Leeds Centre, Wis., and Rochester and Excelsior, Minn., March 26. During the last two days of March and the first day of April, countless thousands of birds were moving in the Upper Mississippi Valley. Among them the Robin was not a small factor, and its arrival was noted in northern and northwestern Iowa at Williamstown, Sioux City, and Emmetsburgh; at Hastings in eastern Minnesota; at Heron Lake in southwestern Minnesota, and at Durand, Luck, New Cassel, and Green Bay, Wis. Just north of these places the following line of stations reported the first April 3 and 4: Grand View and Huron, Dak ; Minneapolis (two observers), Fridley and Elk River, Minn.; and Menoken, Dak., (April 5). A 25-mile ride at White Earth, Minn., found the country quite well sprinkled with small flocks, more than two hundred in all being seen, where all the previous spring not a Robin had been found. Two days later the first Robin made its appearance at Oak Point, Manitoba, where the species was marked as common, April 9. These were probably early birds, since the other records for Manitoba are Shell River, April 13; Two Rivers, April 16; and Ossowo, April 18, and it was not considered common at any of these places before April 20. The whole record from Saint Louis is as follows: March 2, first, a summer sojourner at its stand; March 3, small troops of transients on the wing; March 5, first female at stand; March 10 to 14, the bulk of the summer sojourners arrived at their stands, and many transients passed in flocks; March 26 to April 2, the most conspicuous songster; April 2, the bulk of transients had gone north, light-colored troops still lingered; April 11 to 16, parties of transients were still with us; April 17, last flock seen.

Col. G. B. Brackett writes from Denmark, Iowa, that about the middle of April, for the last three years, immense flocks of Robins, numbering many thousands, have come to roost at night in the evergreens on his premises. They usually remained about two weeks.

In the fall of 1885, at Ossowo, Manitoba, the last Robin was seen October 20; at Elk River, Minn., October 21; River Falls, Wis., October 29; Lanesboro, Minn., November 3; Milwaukee, Wis., November 11; Iowa City, Iowa, October 26; Des Moines, Iowa, October 24; Fernwood, Ill , November 21; Fayette, Mo., October 28, and Mount Carmel, Mo., October 18. At Saint Louis, Mo., the first large flocks going south were noted September 9; from October 5 to 27 Robins were numerous; the last flock was seen October 30, and the last transient November 11. At Bonham, Tex., the first migrant came in October; the next was seen October 28, and they had become common by November. None were noted at Gainesville, Tex., until November 11.

761 a. Merula migratoria propinqua Ridgw. [7*a*.] *Western Robin.*

October 12, 1883, Colonel Goss killed two out of a flock of seven at Wallace, Kans.; and Mr. Lloyd found a single flock in winter at San Angelo, in southwestern Texas. Mr. Lloyd says they are abundant in winter west of Tom Green County in Texas.

766. Sialia sialis (Linn.). [22.] *Bluebird.*

The Bluebird breeds from the Gulf of Mexico northward to southern Manitoba. It is another familiar bird whose coming each spring is eagerly looked for, and whose movements are closely watched through the summer. Over the southern part of the United States his admirers are denied the pleasure of looking for his arrival, for he remains throughout the year. Hardy by nature, and capable of adapting himself to the food of the season, he remains at his post winter and summer. Ornithologists claim that these winter birds are not the same individuals which are seen in summer, but that the summer birds have moved southward and their places have been supplied by arrivals from the north. This of course is generally true, and yet it is also a fact that from latitude 37° southward there are occasionally Bluebirds which keep their summer stations all through the winter, and it is not safe to say that none do so even up to latitude 39°. While its winter distribution is quite similar to the Robin's, and governed likewise by the food supply rather than the temperature, yet the average winter range of the Bluebird is a little more to the north, and it is as plentiful at latitude 39° as the Robin is at latitude 37°. Mr. Widmann contributed the following note from Saint Louis, Mo.:

> In rough weather they spend much of the time in their holes, that is, Woodpeckers' holes, which they enlarge for their own use as shelters and roosting places. November 30 (1883) I watched a pair, when the female repeatedly entered the hole, brought out each time a bit of dead wood and reached it to the male, who carried it off a few yards and dropped it.

It is fair to conclude that this pair intended to pass the winter at that locality. Toward the western part of the Mississippi district the species is not common, giving place to the Rocky Mountain Bluebird (*Sialia arctica*). It is not abundant much west of longitude 97°. Immense numbers were reported in winter from southwestern Texas; and these must migrate largely to the northeast. Mr. Lloyd says the species is resident in portions of Concho County, Tex.

Throughout the winter of 1883–'84 Bluebirds remained at suitable places between latitude 37° and latitude 39°, but were driven from less favorable localities by the severe weather of January 1. They returned with the first warm wave the last of the month, and by February 1 the van approximated quite closely to the parallel of 39°. Here it came to a full stop, and made no advance until March 9. There were only five records of Bluebirds north of latitude 39° before March 9, and all these were from stations near large rivers. Starting then at latitude 39° on March 9, when the warm south wind was felt, the Bluebirds practically completed their migration before the 1st of April. To be sure, a few individuals were moving north during April and May, but the great bulk of the species stopped between latitude 45° and latitude 46°, and those which went farther north might almost be called stragglers. The impetuosity of their migration was checked, and they moved in small companies, seldom of more than a pair or two, slowly idling along as if undecided where to stop. During March their progress was as follows: By March 16 they had reached latitude 42°, by March 22 latitude 43° 30′, and by March 24 latitude 45°. There is no plainer and better attested record concerning any bird than that of the arrival of the Bluebird, March 24, all along the forty-fifth parallel in Wisconsin and Minnesota. A great change now took place in their speed. They were two months and a day in passing from latitude 45° to latitude 47°. They did not appear at Frazee City, Minn. (lat. 46° 33′), until May 25; nor was the record accidental, since the same observation has been several times recorded in former years. May 29 a pair of stragglers arrived at Portage la Prairie, Manitoba, the first Mr. Nash had ever seen in the province. They remained, and at last accounts were breeding. This is one of the most northern records for the species. Mr. Seton (now Thompson) states that it is rare in Manitoba, but most common in the region about Winnipeg.

Again, as in the case of the Robin, the extreme western records are found to be much later than the eastern. At Ellis (lat. 38° 55′), just west of Manhattan, Kans. (where the species wintered abundantly), none were seen until March 19; and at Vermillion, Dak. (lat. 42° 56′), they did not arrive until March 29. The bulk followed the first very closely, and in but one or two cases was its arrival more than three or four days later.

In the fall of 1884 at Elk River, Minn., the departure of the bulk and the last of the Bluebirds was recorded October 10; and at Des Moines, Iowa, October 25. At Mount Carmel, Mo., the last was seen October 28.

In the spring of 1885 a set of notes was received from about latitude 37°, which can be regarded as indicating either winter residence or very early spring migration. These refer to the presence of Bluebirds during the first week in February in Illinois, Missouri, and Kansas. A little farther north, at Odin, Ill., one was seen February 7. If these records indicate migration, it was at a standstill during the next three weeks, since no other evidence of movement was reported until the last two days of the month.

The bulk of males came to Saint Louis February 28, closely following the first, which had been seen there February 27. February 28 they were seen also at Mount Carmel and Fayette, Mo. The next warm wave (March 3) brought them to Paris and Griggsville, Ill., and the next day they reached Ferry, Iowa, and Aledo, Ill. March 9 was a great day for the movement of Bluebirds in southeastern Iowa, where they were reported at Morning Sun, Richmond, and Coralville, though they had been seen the day before at Des Moines and Newton, in the center of the State. They were seen also March 9, at Peoria, Ill., but the real movement in this part of Illinois took place March 14, at which date they reached Tampico (both observers), Fernwood, and Chicago, and also Clinton, Wis. At this time the van rested at latitude 42° 30′, in Illinois and Iowa, remaining there during more than a week of freezing weather, until March 26, when, according to the testimony of the reports, they spread to Williamstown, Iowa; Stoughton, Milwaukee, Leeds Center, and New Cassel, Wis.; and Lake City and Excelsior, Minn. Hardly a note was made during the next five days, and then a strong movement was noted. March 31 they reached Ripon, Wis., and Hastings, Minneapolis (two observers), and Saint Cloud, Minn. Further advance in eastern Wisconsin was strangely delayed, and the three stations in the vicinity of Green Bay did not report a Bluebird until the last week in April. In the western part of the district migration was still slower. The first was reported from Linwood, Nebr., April 27; Huron, Dak., May 16, and Oak Point, Manitoba, May 26, thus showing the peculiarity already noted in the spring of 1884, namely, that the Bluebird, after traveling in company with Robins, Blackbirds, Killdeers, Ducks, and Geese from its winter home to latitude 44°, then drops behindhand and occupies a month longer than they in performing the rest of its journey.

In the fall of 1885 the last Bluebird was reported from Elk River, Minn., October 16; from River Falls, Wis., October 13; Lanesboro, Minn., October 23; Milwaukee, Wis., October 10; Grinnell, Iowa, November 4; Fernwood, Ill., October 10; Des Moines, Iowa, October 24; Iowa City, Iowa, October 24, and Mount Carmel, Mo., October 30. Three troops of Bluebirds were seen going south at Saint Louis, Mo., September 9, and a flock of over 300, October 7.

767. Sialia mexicana Swains. [23.] *Western Bluebird.*

A straggler from the Rocky Mountain region. In Concho County, Tex., it is a rare winter visitor (Lloyd). At Boerne, Tex., Mr. Nathan Clifford Brown shot two specimens, each from a small flock, January 28 and March 1, 1883 (The Auk, Vol. I, 1884, p. 121). Stragglers have been recorded from Minnesota and Iowa.

768. Sialia arctica (Swains.). [24.] *Rocky Mountain Bluebird.*

This species is seldom found in the Mississippi district except on the high plains of the West and Southwest. It breeds in the mountains, from latitude 36° northward far into British America, and winters from

Kansas southward. It was noted by only two of our observers. At San Angelo, Tex., an immense flock was seen during the winter, and at Ellis, Kans., a few were seen during migration. Previously it was recorded as an abundant winter visitor at Boerne, Tex. (Brown). Most of the spring movement of this species occurs in the latter part of February and in March. It was found in Texas as far east as Gainesville, and has also occurred accidentally in Illinois opposite Dubuque, Iowa. It was also probably seen in the fall of 1883 at Caddo, Ind. Ter., but was not shot, hence the identification is not complete. In the fall of 1884, at San Angelo, Tex., the Rocky Mountain Bluebird first appeared October 8. Mr. Peters writes that at Bonham, Tex., he saw these birds for three or four winters in succession, the last time being in 1880.

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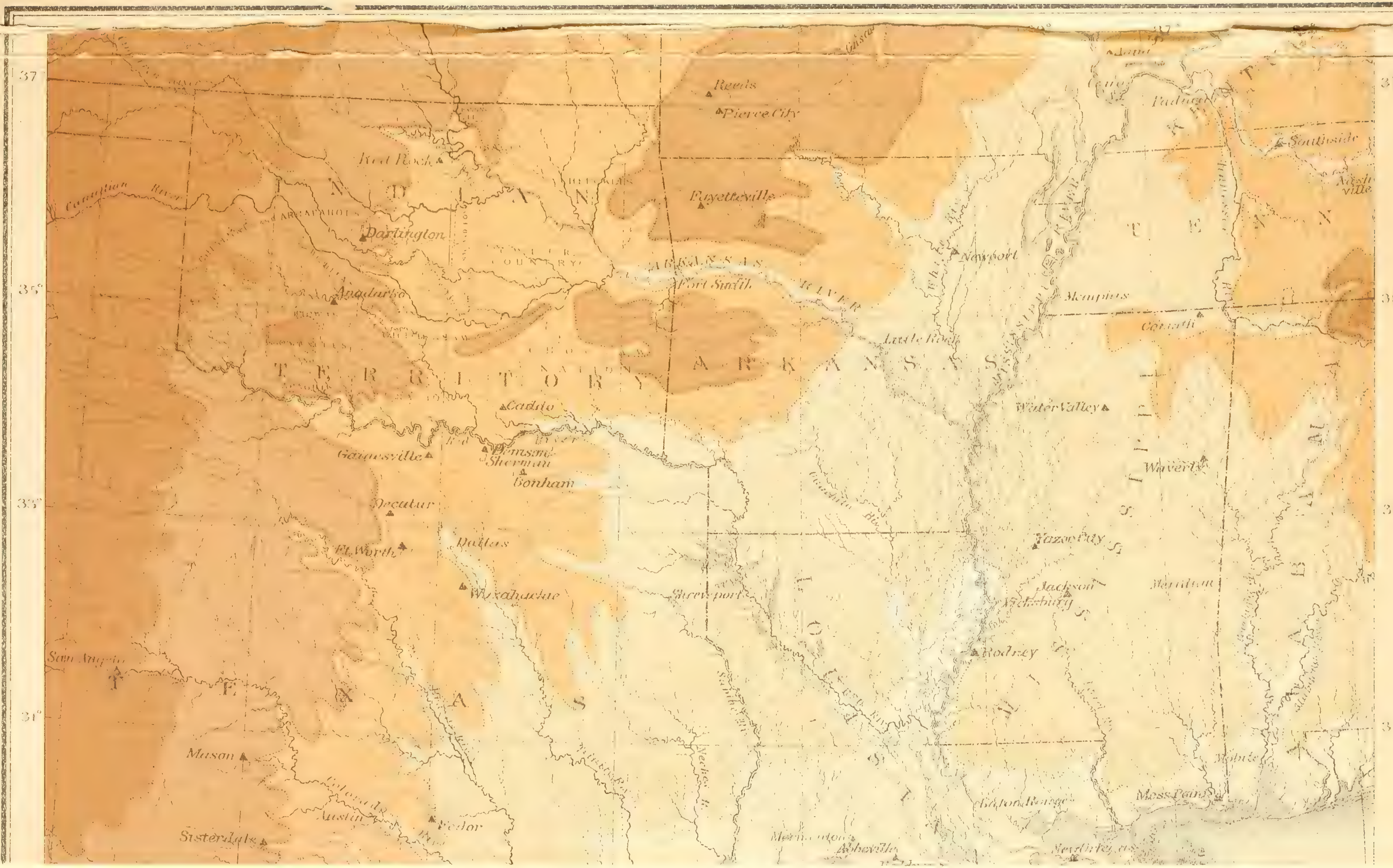
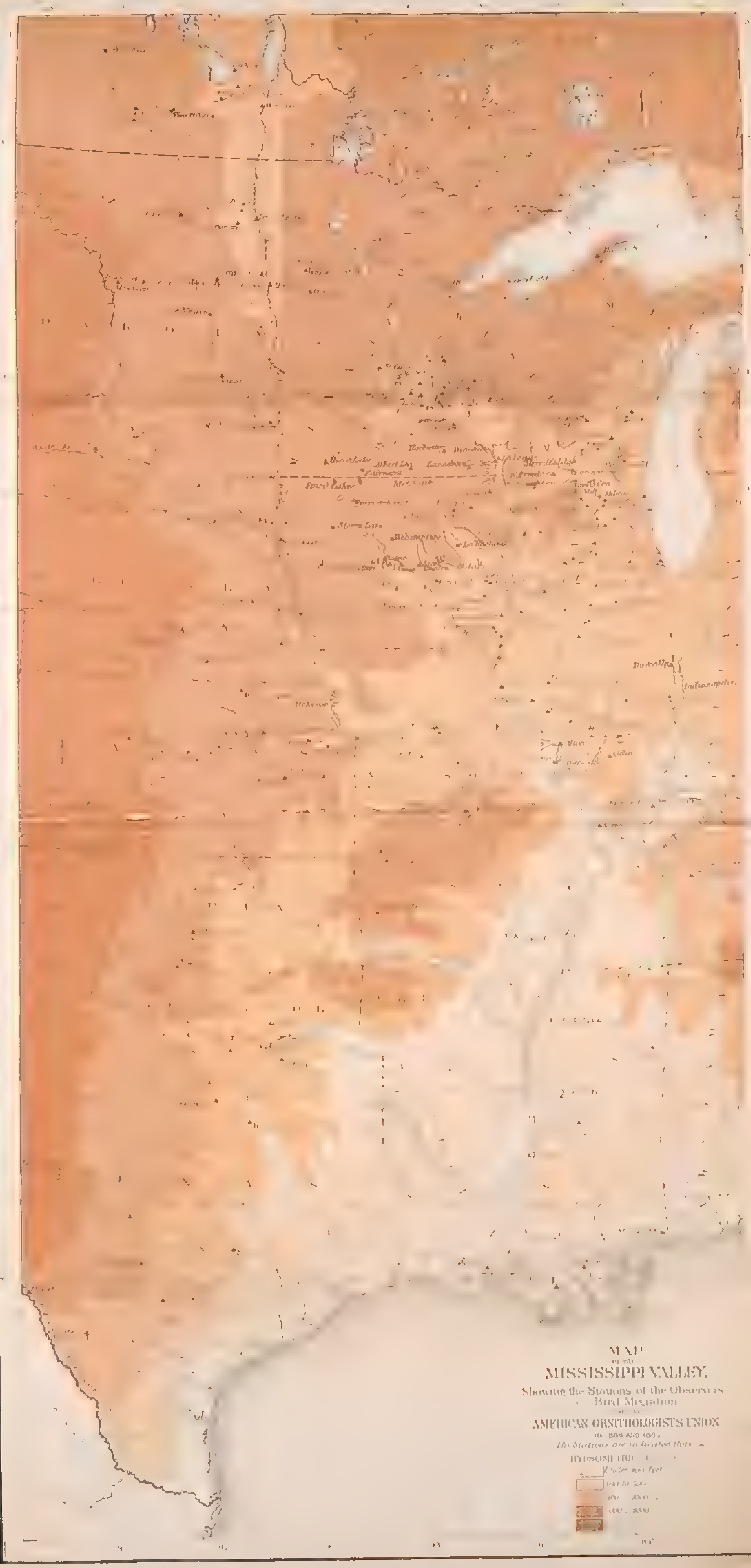

37°
35°
33°
31°
INDIAN TERRITORY
ARKANSAS
TEXAS
LOUISIANA
MISSISSIPPI
TENN.
Red Rock
Darlington
Anadarko
Caddo
Gainesville
Denison
Sherman
Bonham
Decatur
Ft. Worth
Dallas
Waxahachie
San Angelo
Mason
Austin
Sisterdale
Reeds
Pierce City
Fayetteville
Fort Smith
Arkansas River
Little Rock
Newport
Memphis
Corinth
Water Valley
Waverly
Yazoo City
Jackson
Vicksburg
Meridian
Rodney
Shreveport
Red River
Canadian River
Colorado R.
Sabine R.
Neches R.
Baton Rouge
Abbeville
New Orleans
Moss Point
Mobile
Paducah
Southside
Nashville


Rochester
Albert Lea
Fairmont
Lanesboro
Spirit Lake
Storm Lake
Indianapolis

MAP
OF THE
MISSISSIPPI VALLEY,
Showing the Stations of the Observers
of Bird Migration
of the
AMERICAN ORNITHOLOGISTS UNION
in 1884 and 1885.
The Stations are indicated thus ▲

HYPSOMETRIC
Under 500 feet

B52B no. 1

NOV 20 19

MAY 17 1

OCT 16 1

MAR 7 19

FEB 13

8–184

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